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THE
PRACTICE OF MEDICINE;

OR,

A TREATISE

ON

SPECIAL PATHOLOGY AND THERAPEUTICS.

BY

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IN TWO VOLUMES.

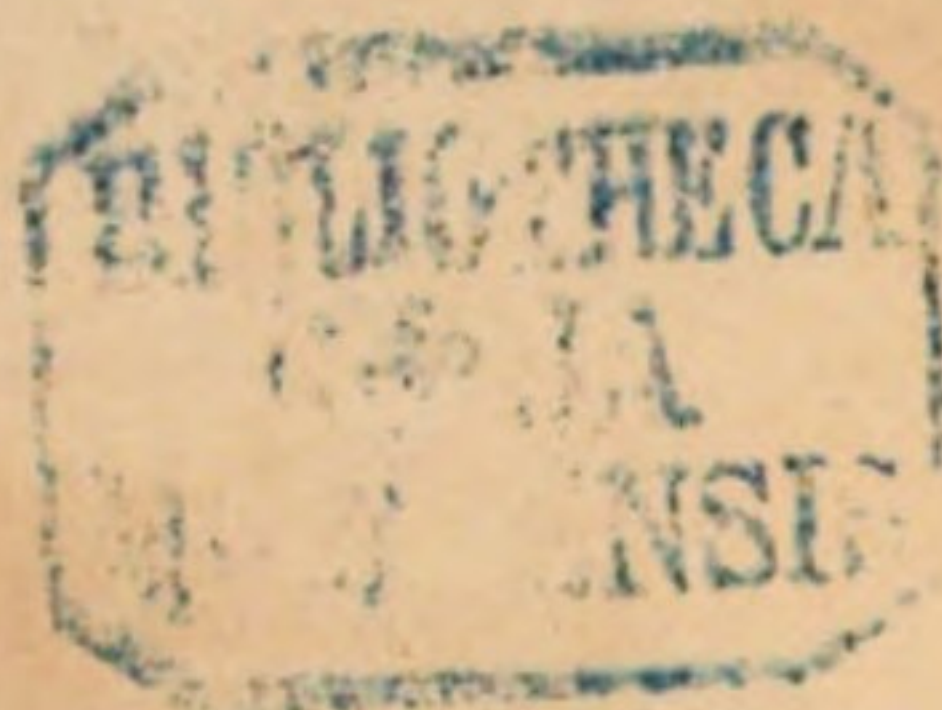
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BOOK V.

DISEASES OF THE GLANDULAR ORGANS.

THE different glands of the body are of a complex organization; yet, when unravelled, their composition is not, perhaps, so intricate as it would, at first sight, appear. Every gland has a vessel which conveys arterial blood for its nutrition, and from this arterial blood the secretion is in all cases formed,—the only supposed exception being in the case of the liver, which receives both arterial and venous blood. Communicating directly or indirectly with the artery, is a vein, whose function is to convey back towards the heart the venous blood, which has become such, owing, in part, to the arterial blood having experienced modifications in fulfilling the offices above mentioned;—and, likewise, a radicle or radicles of an excretory duct, which receives the secreted fluid, and conveys it to some outlet. Lymphatics also exist, as well as nerves; and these are all bound up together, by cellular membrane, so as to form minute granular masses, which, again, are associated by cellular membrane, so as to constitute, in some organs, distinct lobules. These granular masses are closely connected by means of cellular membrane, and finally a cellular sheath covers the whole organ, and preserves its various anatomical constituents *in situ*.

The exact mode in which the vessel, from whose blood the secretion is effected, communicates with the excretory duct, does not admit of ready detection. An interesting pathological case, which fell under the author's observation, (*Human Physiology*, 4th edit. ii. 294, Philad. 1841, and art. "Cancer of the Liver," in the present work,) confirms the view, that the glandular structure consists essentially of a duct with a blind extremity, on whose parietes plexuses of blood-vessels ramify, from which the secretions are immediately produced. (*J. Müller.*)

Of the mode in which secretion in general is accomplished, we know nothing. It occurs—like nutrition—in the very tissue of the organs. Our knowledge appears to be limited to the fact, that in particular organs, various humours are separated or combined from the blood, some of which can be detected in that fluid, and others not. In the upper classes of animals, it would seem, that the

function requires, for its perfect execution, the presidency of a nervous system; yet if we take an enlarged view of organized bodies, the presence of nerves would not seem to be indispensable. In the very lowest classes of animals, nothing like a nervous system has been discovered; and we have the most indisputable testimony of the existence of secretion in the vegetable, in which, if there be a nervous system, it is certainly but rudimental; yet the function is accomplished as perfectly, and perhaps in as multiple a manner as in man.

In the upper classes of animals, however, we have many examples of modification of the function, through the agency of the nervous system:—the sight of luscious food will excite the secretion of saliva, and there can be no doubt that the sight of the offspring occasions an increased secretion from the mammary glands of animals.

The first effect of inflammation of any glandular organ is to arrest its secretion; if the inflammation, however, continues, the secretion is restored, but it does not possess the healthy character. It is more or less modified, and may act upon the excretory ducts, or the parts over which it passes, very differently from the healthy fluid. For example, although bile, when it passes along the intestines, may not irritate the lining membrane, when the secretion possesses its usual properties; it may be the source of much irritation, when its properties have become changed by inflammation, or any other pathological condition of the organ that secretes it.

But although inflammation may arrest the secretion from glandular organs, irritation—short of inflammation—may augment it. Thus, the presence of food in the duodenum excites the lining membrane of that intestine, and the excitation is propagated along the ducts to the liver, which increases its secretion; and the same effect is more distinctly induced by cathartics, that act more especially upon the upper part of the intestinal tract. A yet more striking example of the secretory irritation, induced by particular agents, is that of mercury, whose action upon the salivary glands is one of the most notorious of its properties.

CHAPTER I.

DISEASES OF THE SALIVARY GLANDS.

THE glands, which secrete the saliva, are the *parotid*, the *submaxillary*, and the *sublingual*;—the parotid, situate in front of the ear and behind the neck and ramus of the jaw,—the submaxillary, beneath the body of the bone; and the sublingual, immediately beneath the tongue;—the parotid and submaxillary having each

but one excretory duct—the sublingual several. The secretion from these various ducts is poured into the mouth, where it becomes mixed with the exhalation and mucus from the mucous membrane. It usually contains free alkali, but in rare cases, during meals, it has been found acid, (*Schultz*,) and during fasting, it is occasionally neutral. It has, indeed, been affirmed to be acid whilst fasting, and to become alkaline during eating, the alkaline character disappearing, at times, with the first mouthful of food.

I. INFLAMMATION OF THE PAROTID.

SYNON. Inflammatio parotidis, Parotitis, Parotiditis, Empresma parotitis, Angina parotidæa, Cynanche parotidæa, Angina externa, Mumps, Branks; *Fr.* Parotide, Inflammation de la Parotide, Oreillons; *Ger.* Entzündung der Ohrspeicheldrüse, Ohrdrüsenentzündung, Bauerwetzeln, Ziegenpeter.

Inflammation of the parotid gland is singular, in regard to some points connected with its pathology, and, especially, in affording examples of strange sympathies, which exist in the morbid condition of the gland, but are not perceptible in the physiological or normal state.

Diagnosis.—The disease is ushered in by the ordinary general phenomena of internal inflammation; after which, or simultaneously, a sense of pain or uneasiness is experienced in the region of the parotid, with difficulty in mastication, which becomes, at times, almost impracticable. Sooner or later, beneath one or both ears, more or less tumefaction is observable, which is commonly red and hot, and extremely painful on pressure. Occasionally, the pain is so severe as to deprive the individual of rest. When the inflammation is considerable, the swelling extends to the submaxillary glands, to the tonsils and the neighbouring parts of the pharynx, so that deglutition becomes very difficult and painful. The tumour, in such case, is generally of a deep red, tense and glossy; and if both sides are affected at the same time, the face becomes of an enormous size. The swelling rarely goes on augmenting more than four or five days; after which it gradually subsides, when the termination is about to be by resolution.

Cases occasionally occur, in which the swelling is rather œdematous than highly inflammatory, and in which it presents neither redness, very marked resistance, acute pain, nor difficulty in moving the jaws. The general symptoms, may, in such cases, be slight also. (*Andral*.)

Most commonly the disease terminates by resolution. About the fourth or fifth day, the swelling, pain and fever gradually subside, and the inconvenience disappears. It has been asserted, (*Andral*,) that about the fourth or fifth day, a copious perspiration bathes the parotid region and the parts of the neck, ears and head in its vicinity; and that, in other cases, a general perspiration precedes the gradual softening and disappearance of the tumour;—but there is nothing constant in the order of the phenomena. Those, mentioned by *Andral*, are often seen in cases where the cutaneous

transpiration has been arrested, for a time, in consequence of febrile or inflammatory indisposition.

In some cases—but they are rare—inflammation of the parotid ends in suppuration; the tumour points, and fluctuation is manifest. The author has met with but one case of this kind. The termination in gangrene is still more uncommon.

A very frequent occurrence, and one which is the most interesting point in the pathology of the disease, is the metastasis or translation of the irritation from the parotid to the testicle of the same side, in the male; and to the mamma in the female. In the female, the sexual organs are also said to swell occasionally under the same circumstances, but the author has never met with such a case. Usually, the tumour of the parotid suddenly subsides, and all the signs of inflammatory irritation diminish, or cease, and almost immediately afterwards, pain and inflammation are experienced in the parts mentioned.

The orchitis in the male; and the mastitis in the female, under appropriate management, generally terminate by resolution; but, at times, the affected testicle is entirely absorbed.

Occasionally, the inflammation of the testicle in this “changeable phlegmasia”—as it has been termed—leaves the testicle as suddenly as it invaded the organ, and a fresh attack of parotitis supervenes.

Causes.—Age certainly offers a predisposition; for the disease is most common in children, and the proportion of males attacked is greater than of females. After the period of puberty it is less frequently seen. One attack appears to produce an effect upon the constitution, which renders the individual less liable to the disease again; for second attacks are not common. The disease unquestionably appears epidemically, or rather endemically;—that is, we see it in a particular locality prevailing more than in others, and perhaps exclusively; showing, that there are local causes which give rise to it, under probably favourable atmospheric influences—or the disease must be esteemed endemico-epidemic in its character. (*Hamilton.*) Inflammation of the parotid often, too, occurs as sympathetic of other diseases; as in the course of severe fevers; but to this variety reference is made elsewhere. In some of the visitations of cholera, it was noticed, especially towards the end of the epidemic. This was the case in Paris, (*Rayer and Duplay,*) and in Rostock. (*Most.*) Generally, the disease is looked upon as contagious, but the author’s observation does not enable him to speak positively on this point. It is, indeed, extremely difficult to decide the question, in consequence of the persons attacked being generally in the same locality, and more or less exposed to the same influences.

Treatment.—This must be altogether antiphlogistic; but the disease does not usually demand much activity. If the tumour be extremely large, hot and painful, local depletion, by means of leeches, may be employed, and repeated as it may be necessary;

and after each application emollient poultices may be placed over the leech-bites. At the same time, saline cathartics may be administered, so as to act gently on the bowels; and the patient be put upon diet, which is appropriate in other inflammatory affections,—strict quiet being, at the same time, enjoyed. This treatment is generally sufficiently active for the more severe cases. In those that are less so, cataplasms, rest, abstinence, and covering the part with flannel, are sufficient. Both in its stage of inflammation and of suppuration, this phlegmasia has to be managed according to general principles;—it must be borne in mind, however, that the affection usually runs a definite course, or appears to be self-limited; and that any unfavourable termination is extremely rare; so that great energy of treatment cannot be demanded.

When the inflammation has attacked other organs metastatically, the rule of treatment should be, to combat these secondary affections as if they were primary, having no regard to the original inflammation of the parotid. Usually, the indication is presumed to be, to call back the irritation to the part primarily affected, by the application of revellents—as of sinapisms or blisters—to the region of the parotid. The remedy, however, as the author has elsewhere said, (*General Therapeutics*, p. 348,) is not as clearly indicated as might at first appear. The organs concerned seem to possess a reciprocal sympathy under particular morbid conditions only, between which, and the irritation excited by revulsives, there may not be the least similitude; and this accounts for the want of success experienced, whenever an attempt is made to recall a “changeable phlegmasia” to its former seat. The author—in accordance with the views generally entertained on this matter—has repeatedly attempted to bring back the inflammation to the parotid, yet he does not recollect any instance in which the appeal was responded to; and hence he attends to the superinduced inflammation, as if it were primary. It is, indeed, by no means clear, that the artificial irritation, which we excite over the region of the parotid, in such case, can be practised with entire impunity. The inflammation, which we are desirous to call back—it must be recollected—was originally seated in the region which we are about to irritate artificially; and a question might properly arise, whether the artificial irritation, which we induce, may not equally pass to the organ secondarily implicated, and add to the mischief already existing; so that revellents, applied to the parotid region, might in reality be less safe and efficacious than if they were applied to any other part of the economy.

Occasionally, symptoms of encephalitis and of gastric inflammation occur in the course of parotitis. They must be met upon the same principles.

II. PTYALISM.

SYNON. Ptyalismus, Sialismus, Sielismus, Sialachus, Salivatio, Epiphora ptyalismus, Sialorrhœa, Salivation; *Ger.* Speichelfluss.

An increased secretion of saliva may arise from various causes,

and is frequently altogether symptomatic,—as in children, during dentition. When it occurs as a symptom, it will be described under the primary affection.

Ptyalism may be considered under two heads—the *first* embracing that which arises spontaneously, often without any obvious cause; and the *second*, that which is produced by mercury.

a. *Spontaneous Ptyalism.*

SYNON. Ptyalismus idiopathicus, P. spontaneus, Idiopathic Ptyalism or Salivation.

Salivation occasionally occurs, especially in children, with all the characters of mercurial salivation, when not a particle of mercury has been administered. It is essential to bear this fact in mind, inasmuch as blame is frequently attached to the medical practitioner, where such symptoms arise, under the idea that he has been administering mercurials to an objectionable extent. Salivation may be induced by various articles,—as by iodine, (*Eager, Manson, Winslow, Ely, Mackall*), the preparations of gold, copper, antimony, arsenic, and it is said that it has followed the employment of castor oil, digitalis, and opium. (*Watson*.) Cases are on record, in which it has occurred to a profuse extent, without any obvious cause. Thus, one is related in which two or three pints of saliva were discharged daily for some time. The affection ceased under the use of gentle cathartics. (*Davies*.) Many similar examples are on record. (*Power, Prout, Pereira, Watson*.)

Treatment.—Should such a case present itself, it will be important to examine, whether there be any form of stomatitis, or irritation, from carious teeth or otherwise, in the mouth. Should no adequate cause be discoverable, the disease must be referred to some constitutional or local affection of the glands, which gives rise to secretory irritation and consequent hypercrinia.

Certain of the remedies, recommended under the next form of ptyalism, may be found serviceable.

b. *Mercurial Ptyalism.*

SYNON. Ptyalismus hydrargyratus, P. mercurialis.

Diagnosis.—The symptoms of mercurial salivation are well known; but, fortunately, not so much so as formerly, in consequence of the comparative unfrequency of the affection, owing to our improved knowledge of the therapeutical effects, and *modus operandi* of mercury.

Prior to the supervention of full ptyalism, symptoms present themselves, which indicate that the mouth is “touched” by the mercury. A disagreeable coppery taste is experienced, accompanied by a painful feeling or soreness in the mucous membrane of the mouth, and in the teeth, which appear to be loosened in their sockets; to these phenomena succeed swelling of the gums, inner surface of the cheeks, tongue, and soft palate, which become hot and painful, and, where the cheek and tongue are pressed upon by

the teeth, they are found indented. The gums now fall away from the teeth, and at the edges a whitish secretion is poured out, which has an albuminous appearance. This secretion seems, indeed, to invest the mucous membrane of the mouth, which, consequently, does not appear to be as red as the symptoms would indicate. The parts that are the most swollen and subjected to pressure, soon begin to ulcerate, and the ulcers spread, and present a grayish, flabby and fungous appearance, blood flowing from them with readiness. The lymphatic ganglions, situate between the parts affected, and the centre of the lymphatic system, now become swollen and painful; and, at times, the patient is unable to separate his jaws, and almost to swallow, owing to the excessive tumefaction of the parts. From the very commencement, the breath has a peculiar fœtor, and this augments, so that at the height of the disease, it is strong and disagreeable.

As soon as the mouth is touched by the remedy, the flow of saliva, and of the mucous secretions of the mouth becomes so much augmented, that the individual is compelled to eject the fluid continually, and where complete ptyalism has set in, the quantity evacuated is occasionally enormous. Eight pounds in the 24 hours have been mentioned, (*Andral*,) but this is not the limit. Sixteen pounds are said to have been discharged in this way, (*Most*;) the average quantity in health not exceeding four ounces. (*Mitscherlich*.) This increased flow may exist—to a greater or less extent—for many days or even weeks.

At one time, the effect of the remedy in syphilis was measured by the quantity of saliva discharged:—if the disease were of a certain duration the patient must spit a quart; if of a longer, two quarts, and so on: but now, since the conviction of the practitioner is, that salivation is rarely or never necessary, and that it is rather to be deplored,—inasmuch as the increased discharge exhausts and irritates, without being of itself beneficial,—the practice has been abandoned, and if we meet with cases of excessive ptyalism, it is, generally, in those who are easily affected by mercury and in whom the affection supervenes rapidly; or in those in whom the remedy has, by accident, been persisted in for a longer period than was contemplated. The books were formerly filled with descriptions of the horrible accidents induced by mercurial ptyalism, some of which the author has witnessed;—as extensive sloughing, loss of teeth, caries of the jaw bones; protrusion of the tongue from the mouth; adhesions of the tongue and cheeks, &c. &c.; with at times excessive febrile irritation, marasmus, and death. This last event was, however, uncommon. Usually, after a tedious convalescence, the sufferer was restored to health, but occasionally the system received an injury from which it never wholly recovered.

Although the plan of exciting profuse salivation for the cure of syphilis may now be considered as generally and properly exploded, and, therefore, these cases of ptyalism are comparatively rare, we still now and then observe the deplorable effects of mer-

cury pushed with equal incaution for the treatment of many of our bilious and other fevers.

Not many years ago, an interesting case fell under the author's care, in which the lower jaw became firmly closed in consequence of the formation of ligamentous bands, and of the contraction that had occurred during the cicatrization of mercurial ulcers of the mouth; the bones of the jaw were carious, and portions of them exfoliated; yet, by careful management,—improving the general habit, and separating the jaws gradually by an instrument contrived for that purpose, they gradually became movable. Within the last two years, the author has known of other similar cases, the subjects of which had sought Philadelphia for surgical relief under their deformities.

Causes.—The term mercurial ptyalism sufficiently indicates the exciting cause; but a few remarks are necessary on predisposition. Unquestionably, age has its influence. It is almost impossible,—wholly so, perhaps, in most cases,—to salivate a child under two years of age. There is something in the peculiar evolution of organs at this age that prevents it; yet, after the age of two, children become very susceptible of mercurial influence, and remain so, although not perhaps to an equal degree, throughout the remainder of their existence. There is, likewise, a marked difference in individuals as to their susceptibility to the action of mercury,—some being affected by the smallest quantity, whilst it is impossible to salivate others by any amount.

Temperature has some effect, and exposure to cool air. In hot weather, especially if the individual take exercise, the mercury appears to pass off by the cutaneous transpiration; and, on the other hand, the repression of the transpiration frequently induces ptyalism. Constipation also appears to favour the action of mercury, as diarrhœa usually prevents or retards it.

It is difficult to account for the action of mercury in inducing ptyalism. It obviously, however, enters the blood, for it has been detected in that fluid, (*Colson, Christison,*) and, in this way, probably, it excites a new action not only in the salivary glands, but, apparently, in almost all the secretory organs of the economy.

Treatment.—If the febrile and inflammatory symptoms run high, blood-letting—general and local—may be demanded; but this can seldom be the case. It is a favourite remedy, at the commencement, with one distinguished individual, (*Cullerier.*) Generally, it is best to administer saline cathartics, which act in a twofold manner, both as depletives and revellents.

R.—Magnes. sulphat. $\mathfrak{z}$ vj.

Aq. menthæ pip. $\mathfrak{z}$ iv.—M.

Dose.—One fourth, night and morning.

They should be given to the extent of producing at least two or three liquid evacuations in the twenty-four hours for the first two or three days, unless their use is contraïndicated. The preparations of sulphur—sublimed sulphur, and sulphuret of potassa—combined, or

not, with sulphurous baths, have been long prescribed; under the idea, that the sulphur would exert some chemical agency in modifying the action of the mercury. But few entertain this opinion at the present day; sublimed sulphur is, however, a gentle and pleasant laxative, and may be given with that view.

In the early period of the disease, emollient and warm collutories are found to be the most soothing. These may consist of mucilage of gum arabic, flaxseed tea, infusion of the slippery elm, and similar mucilaginous articles; but, in the after stages, greater advantage will be derived from agents of a more excitant character. Various astringents have been used for this purpose, such as the acetate of lead, the sulphate of zinc, and the sulphate of alumina and potassa. The author thinks that he has derived as much benefit from the solution of chloride of lime and from that of creasote as from any other agents. It must be borne in mind, however, that the art of medicine, in the generality of cases, does not appear to possess much power over the disease, and that whatever internal or external remedy is employed, *time* is an essential element in the cure.

A collutory of the chloride of lime not only appears to diminish, in many cases, the excessive secretion from the salivary glands, but speedily mitigates the sense of burning in the mouth, induces the healing of the erosions of the mucous membrane, and corrects the mercurial fœtor.¹ If either this, or the creasote wash,² should be too stimulating, it must be reduced by the addition of water.

¹ R.—Calcis chlorid. ʒj.

Aquæ, Oj.

Vini opii, ʒiss.—M.

The mouth to be well washed with a little of this solution six or seven times a day.

² R.—Creasot. gtt. xxx.

Aquæ, Oj.—M.

By many, the internal use of iodine has been highly extolled; (*Von Helmenstreit, Kluge, Knod, Klose, Graves;*) yet, in the experience of others, its efficacy has been doubtful. (*Heyfelder.*) It may be given in the form of the tincture, (ten drops, three times a day, in gruel.)

If ulcerations exist, and they resist the local management above directed, they may be treated upon the plan advised under the head of Stomatitis. Should the pain be so severe as to preclude rest, opium or its preparations may be freely administered.

The diet, throughout the severity of the disease, should consist of farinaceous substances; but, later on, milk, broths, and the lighter preparations of animal food, may not only be permitted, but be advisable.

The salivary glands, and especially the parotid, are liable to cancer, and other morbid transformations, and their ducts to various diseased conditions; but as these belong rather to the domain of surgery, they are passed over here. Their pathology is the same as that of similar affections of the pancreas, to be next considered.

CHAPTER II.

DISEASES OF THE PANCREAS.

THE pancreas or "sweet bread" is so like the salivary glands in structure and functions, that it has been called by some the "abdominal salivary gland." Its position must be borne in mind, which is transversely in the abdomen, behind the stomach, and towards the concavity of the duodenum. It is, on the average, about six or seven inches long, and weighs from two and a half to three or four ounces. Of six observed cases, the mean weight was two and a half ounces, and the mean length seven inches. (*Professor Gross*, of Louisville.) In thirty-two other cases, however, (*Bécourt*,) the average length was eight inches, and the weight between three and four ounces, French. Its excretory ducts all terminate ultimately in one—the duct of *Wirsung*—which opens into the duodenum—at times, distinct from the *ductus communis choledochus*, but close to it; at others, confounded with, or passing into it.

The consistence of the pancreas, at different periods of life, does not vary greatly; but, like the salivary glands, it becomes materially modified by disease.

I. INFLAMMATION OF THE PANCREAS.

SYNON. *Inflammatio pancreatis*, *Pancreatitis*; *Fr.* *Pancréatite*, *Inflammation du Pancréas*; *Ger.* *Entzündung der Bauchspeicheldrüse*, *Bauchspeicheldrüsen-entzündung*.

It is only of late years, that the diseases of the pancreas have been much investigated. In the year 1812, an *ex professo* treatise was published on the subject, (*Harless*,) and, within the last few years, a more complete monograph has appeared, (*Mondière*,) which received a prize from the *Société Médicale d'Emulation* of Paris. The author, last cited, is of opinion, that acute inflammation of the pancreas is more common than is generally believed.

Diagnosis.—The symptoms, assigned to this disease, are—disagreeable feeling of oppression, and dull pain, deep in the epigastrium, which is fixed, and increased when the stomach is filled, on full inspiration, and when strong pressure is made on the abdomen. The epigastric region is at times swollen, and the functions of the stomach are greatly disordered; more or less anorexia and evidence of dyspepsia exists; and there is, occasionally, a copious vomiting of matter, having the appearance of saliva,—as well as diarrhœa, constituted, at first, of a mixture of aqueous and bilious matters with the aliment, and, subsequently, of fluid like saliva.

When the tumefaction of the pancreas is considerable, the pulsations of the aorta are conveyed forcibly to the hand placed on the epigastrium.

Along with these symptoms, there is more or less general febrile irritation, as in other phlegmasiæ of the abdominal organs.

None of these symptoms can be looked upon as pathognomonic; nor do they, when taken together, lead to more than a probability that pancreatitis exists; yet the probability is so strong, that it may be unhesitatingly acted upon.

The disease rarely proceeds to suppuration; more frequently, it terminates in induration, of which the author has seen many examples. The termination in gangrene is very rare.

Causes.—Pancreatitis may—like inflammation of the salivary glands—be idiopathic; but, doubtless, it more frequently arises from diseases of the stomach or duodenum. It is often, especially in the chronic form, connected, also, with disease of the liver; and, in the majority of instances, the two diseases will be found to acknowledge the same cause. The constant irritation of the stomach and duodenum in drinkers of alcoholic potations may be propagated along the duct of Wirsung to the pancreas, as it is propagated along the common choledoch duct to the liver, so that the functions, carried on in the capillary system of the pancreas, may be morbidly implicated simultaneously with those of the liver.

Pathological characters.—In the few cases of acute pancreatitis that have been examined after death, the pancreas has been found red and swollen, and sometimes of greater, but at others, of less consistence than in health.

Treatment.—Where acute pancreatitis is suspected, it must be met by bleeding—general and local—and the whole antiphlogistic plan. The only caution, needed, is in the administration of violent cathartics, whose irritative action could scarcely fail to be extended along the pancreatic duct, and to add to the irritation. It is sufficient to keep the bowels daily open by the gentlest laxatives, or by enemata.

Chronic pancreatitis has been more frequently described than the acute. (*Percival, Heineken, Eying, Portal, Petit, Schmackpfeffer, Jallat, Mondière.*) It may be the result of the acute form, or may exist from the first, and it is a more frequent concomitant of diseases of other organs of the abdomen.

In one case, in which an opportunity occurred for examining the body after death, the symptoms were copious evacuations of fluid from the bowels, which was regarded as resulting from an increased secretion of the fluid of the pancreas. At a later period, constipation supervened, and, ultimately, a tumour was perceptible in the epigastric region. On dissection, the pancreas was found red, swollen, and as soft as a sponge; the duct much dilated. It weighed seven ounces. (*Schmackpfeffer.*) In other cases, it has acquired a great increase in density.

The pancreas is also liable to various transformations, as the “adipose” or “fatty;” (*Dupuytren, Lobstein, Bécourt;*) “the encysted;” (*Bécourt, Mondière;*) the “scirrho-cancerous;” (*Abercrombie, Mondière, Andral, Bécourt, Craveilhier;*) the “encephaloid;” (*Abercrombie, Mériadec Laënnec, Duponchel;*) the “tuberculous;” (*Varnier, Glutigny, Nasse, Bouillaud, cited by Mondière;*)

the "melanotic," (*Henri, Gohier, Mackenzie*;) the "calculous;" (*Schurigius, Portal*,) &c. &c.; of which *Mondière* has given an ample description; but there are no phenomena that positively indicate their presence, and they are, consequently, most interesting in their relations to pathological anatomy.

Various diseases have been ascribed to an increased secretion of the fluid of the pancreas. It has been suggested, indeed, whether cases of enterorrhœa are not of this nature. (*Mondière*.) Others have referred the greater part of the forms of diarrhœa to this cause; (*Portal*;) and a distinguished surgeon, (*Dupuytren*,) has suggested, whether the pancreas may not furnish the matter evacuated by persons labouring under cholera. It has, moreover, been suggested, that the fluid of pyrosis may proceed from the pancreas. (*Mondière*.) We cannot say, that these speculations are altogether devoid of foundation, or that they are irrational; but it may be averred, with safety, that the arguments in their favour are by no means convincing.

CHAPTER III.

DISEASES OF THE BILIARY APPARATUS.

The apparatus for the secretion of the bile consists of the liver and hepatic duct; the gall-bladder and the cystic duct; and the common choledoch duct, formed by the union of the hepatic and the cystic duct.

The liver is situate in the right hypochondriac region, and more or less in the epigastrium. Its ordinary weight is three or four pounds; and in health it probably never exceeds, materially, the latter. In disease, it has been known to weigh 20 or 25 pounds; and, in other cases, not as many ounces.

The connection or proximity of the organ to other organs must be borne in mind. Its upper convex surface touches everywhere the arch of the diaphragm. The lower concave surface corresponds to the stomach, colon and right kidney.

The liver—it will be recollected—receives two kinds of blood—that of the hepatic artery, and that of the vena porta. The common opinion is, that the former is intended for the nutrition of the liver; the latter for the secretion of bile. For reasons elsewhere given, (*Human Physiology*, 4th edit. ii, 292, Philad. 1841,) the author embraces the view, that as in the case of other secretions, the bile is formed from arterial blood; and that the arrangement of the portal system is for the purpose of mixing thoroughly the various heterogeneous fluids, which are readily absorbed from the mucous membrane of the stomach and duodenum, so that they may not be sufficiently concentrated to act injuriously on the heart when they reach that organ.

Besides the radicles of the hepatic artery and the vena porta, the liver consists of the following anatomical elements;—the various terminations of the excretory or biliary ducts, which are probably blind at their extremities, having the capillary vessels that secrete the bile ramifying upon them;—lymphatic vessels,—nerves, some proceeding from the pneumogastric, but the majority ganglionic,—the supra-hepatic veins, which, according to common belief, communicate both with the final ramifications of the hepatic artery, and the vena porta, and return the blood to the heart. All these parts, united together by cellular substance, constitute the liver, which has two coats,—the outermost peritoneal, and the innermost cellular, and forming the proper coat. The former does not cover the posterior part of the organ, the excavation for the gall-bladder, the vena cava or the fissures in the concave surface. The latter invests not only every part of the surface of the liver, but the large vessels that are proper to it.

The colour of the liver differs in health; according to age and various circumstances. In the adult, it is generally of a reddish-brown colour, with bluish spots, especially on the anterior margin and the under surface, dependent probably upon cadaveric hyperæmia.

When the liver is torn, it exhibits the appearance of numerous granules, each of which probably consists of the anatomical elements mentioned above, packed together so as to constitute one of the myriads of glands inservient to the biliary secretion. In certain cases of disease, this granular arrangement becomes very manifest.

The situation of the gall-bladder must be kept in mind. It is at the inferior concave surface of the liver, with which it is connected; and above the colon and the duodenum. The largest part or fundus is turned forwards; and, when distended, it frequently projects beyond the anterior margin of the liver. Externally, it is partly covered by the peritoneum, which attaches it to the liver, and to which it is moreover adherent by cellular tissue and vessels.

Connected with its diseases, it is important to remark, that it has, at least,—a mucous coat, which extends down its duct—the cystic, and into the common choledoch duct; and a coat, which is exterior to this, and between the mucous and the peritoneal coat, which is contractile. Without this belief, it would not be easy to explain certain phenomena in disease; and, besides, pathological anatomy has sufficiently demonstrated the existence of fibres, which must have been contractile.

The hepatic duct, which is formed by the union of all the excretory ducts of the liver, is constituted anatomically like the cystic duct; and the same may be said of the common choledoch duct. The hepatic and cystic ducts are about the same length—an inch and a half,—and are about the size of an ordinary writing-quill. The common choledoch duct is about three or three and a half inches long. It descends behind the right extremity of the pancreas, through its substance, passes for an inch obliquely between

the coats of the duodenum, and opens at the inner surface of the intestine, at the distance of three or four inches from the stomach. Towards its termination, it diminishes in diameter, and its orifice in the duodenum is more contracted than any other portion.

As in the case of the pancreas, a continuous surface exists between the interior of the duodenum, the gall-bladder, and the minutest radicles of the biliary ducts in the liver; so that it can be readily understood, how much the condition of the biliary apparatus is connected with that of the intestinal canal. To this subject, however, reference will have to be made in the consideration of the various diseases of the apparatus.

In regard to the fluid secreted by the liver, it differs according as it proceeds directly from the liver along the hepatic duct, or has been retained in the gall-bladder. The latter possesses greater bitterness, and is thicker and of a deeper colour; but they do not differ much from each other, except in the greater concentration of the different elements in the latter. We know not the amount of bile excreted in the course of 24 hours; it will be readily understood, however, that it must vary greatly. The presence of food in the stomach and duodenum during digestion is a natural excitant to the liver; but if the mucous surface of those organs be in a morbid condition, the quantity and quality of the secretion may be materially modified.

I. HYPERÆMIA OF THE LIVER.

SYNON. Hyperæmia hepatis, Congestion of the liver, Hepatic engorgement; *Fr.* Hyperémie du Foie, Hépatohémie, (*Piorry*); *Ger.* Blutanhäufung der Leber, Blutüberfluss der Leber.

At a time when it was the custom to refer more diseases to the liver than has been sanctioned by subsequent and sounder observation, congestion of the liver was invoked to account for many morbid phenomena, which did not admit of ready explanation. No term, indeed—as elsewhere remarked—in the whole range of medical terminology, has been employed with less precision than “congestion.”

As regards hyperæmia of the liver, it is probably generally induced, as it is elsewhere, by disease in some part of the circulatory organs, which prevents the blood from returning regularly to the great central organ of the circulation. In the hyperæmia under consideration, the affection perhaps always consists in some obstacle to the passage of the blood through the right cavities of the heart, which gives occasion to an accumulation in the hepatic vessels.

Diagnosis.—Should hyperæmia of the liver exist to any extent, it is to be presumed, that the size of the organ will be augmented, so that it may extend below the cartilaginous margin of the ribs, towards the left side, or force the diaphragm upwards. In such case, the “jecoral sound,”—as it has been termed—on percussion, would be heard over a larger space. (*Piorry*.) There may, likewise, be more or less difficulty in lying upon the left side. These, it is presumable, would be the signs of simple hyperæmia of the liver,

which, moreover, may supervene rapidly, and disappear as rapidly when the impediment to the circulation is withdrawn.

When the hyperæmia is active, the symptoms will be essentially those of inflammation of the liver.

Pathological characters.—Recent researches, which have been instituted, induce their author, (*Kiernan*), to affirm, that the usual appearance in a healthy liver, of darker spots mottling a yellow parenchyma, results from congestion of the hepatic veins,—the congestion, beyond a certain limit, constituting an abnormous condition or a state of disease; and that, on the other hand, when congestion of the portal system is alone present, the peritoneal surface of the liver, or a section of the liver, displays the appearance of yellowish spots mottling a dark parenchyma. In the former case, the central vessels of the lobules are congested; in the latter, the vessels in the interlobular spaces. Again, when hyperæmia of both sets of vessels exists, the yellow colour disappears from every part of the liver, from the lobules as well as from the interlobular spaces. (*H. Mayo*.)

They, who believe in the existence of two distinct substances in the liver, ascribe the mottled appearance to one of the substances being in a state of hyperæmia, whilst the other is unaffected. (See *Cirrhosis of the Liver*.)

Hyperæmia of the liver is said to be a common affection in India; and, wherever met with, we might expect the colour of the organ to be darker than in the healthy condition, owing to morbid accumulation of blood. When in this state, its texture is usually softened, and the section made with a knife bleeds freely. The peritoneal surface, in such cases, is often marked with numerous clusters of minute vessels, “like the veins on the nose of an old gourmand.” (*Twining*.)

Treatment.—The attention, in cases of hyperæmia dependent upon disease of the heart, must be directed almost wholly to the latter organ: where, however, there are signs of activity of circulation, it will be advisable to apply cups or leeches over the region of the liver, and to give cathartics occasionally, which, by acting upon the lining membrane of the intestines, occasion watery discharges at the expense of the portal system.

R.—Pil. Hydrarg. gr. v.—horâ somni.

R.—Infus. sennæ, 3x.

Tinct. sennæ, 3j.

Magnes. sulph. ʒiij.—M. f. haust. mane seq. sumend.

Where general blood-letting is considered advisable—as it often is—it is a valuable aid to diagnosis; for almost immediately after the operation, percussion will exhibit, that there is a diminution in the size of the liver. (*Piorry*.)

II. INFLAMMATION OF THE LIVER.

SYNON. Inflammatio hepatis, I. jecinoris, Hepatitis, Febris hepatica inflammatoria, Empresma hepatitis; *Fr.* Hépatite, Inflammation du Foie; *Ger.* Leber-entzündung, Entzündung der Leber.

Inflammation of the liver may be considered under two forms,—

the *acute* and the *chronic*;—for although the former may terminate imperceptibly in the latter, the essential phenomena of the disease may be chronic from the first.

a. *Acute Inflammation of the Liver.*

SYNON. Hepatitis acuta.

This is certainly an uncommon disease in temperate regions, whilst in torrid climes, it is by no means unusual.

Diagnosis.—The prominent symptoms of acute hepatitis are,—pain, at times acute and lancinating; at others, dull and heavy, in the right hypochondrium, frequently extending to the chest, and as far as the shoulder of the same side; the pain in the right hypochondrium is increased by pressure, inspiration, coughing, and lying on the left side; and, on the contrary, is relieved by lying on the side affected.

The pain in the right shoulder has, by many, been esteemed pathognomonic; but there is reason to believe, that it is a very equivocal sign, and—having been observed in a few cases—it has been copied from one author to another as diagnostic of hepatitis. (*Rostan, Stokes, Mackintosh, M. Hall, &c.*) In some cases, the size of the liver is augmented; this state may be detected by the signs described under hyperæmia of the liver, and especially by percussion, when the dull “jecoral” sound will be heard over a larger space than usual. The functions of the liver are necessarily modified, and their morbid alterations are detected chiefly by the condition of the alvine and urinary evacuations, and the colour of the skin. Early in the disease,—as in the case of other secretory organs when inflamed,—the secretion of bile is mainly or wholly arrested; the alvine evacuations, under such circumstances, are ash or clay coloured; but commonly the bowels are constipated. The urine is high coloured, so much so as to tinge the linen yellow, and the skin and whites of the eyes exhibit a yellow hue,—symptoms which indicate an approach to—if not the actual existence of—jaundice.

It is not uncommon, too, for the duodenum and stomach to participate in the inflammatory condition, and should this not be the case, the alimentary canal may be sympathetically irritated to a greater or less extent: the patient is affected with vomiting, pain, and tension in the epigastrium, bitter taste in the mouth, yellow furred tongue, and thirst. The accompanying fever is usually highly inflammatory: the skin is hot, and the pulse full and bounding.

The relative frequency of the symptoms, described above as indicative of acute hepatitis, has been noted in sixteen cases. Eleven times, there was pain in the right hypochondrium; once, pain at the top of the right shoulder; five times, tumefaction of the hypochondrium; nine times, jaundice; and five times, there was no local symptom. In all, there was fever, but it was not always the same; it was continued in thirteen cases, and paroxysmal in three. (*Roche.*) There is truth, consequently, in the opinion, that although no one

of the symptoms can be esteemed pathognomonic; yet when taken together, they can scarcely fail to lead to a satisfactory diagnosis.

It has been a question with observers, whether inflammation of the convex surface of the liver presents symptoms differing from those that belong to inflammation of the concave surface. Perhaps, in the generality of cases, the pain—in the former—will be found more acute and lancinating, and more increased on inspiration, coughing, and pressure; whilst in the latter, the pain is more deep-seated; it is little, if at all, augmented on pressure, and efforts at vomiting always increase it greatly. Differences of this kind may, and do, exist, and yet we may have to pronounce on the precise seat with caution. The more superficial the inflamed surface,—that is, the nearer it is to the abdominal parietes,—the more likely will it be to be indicated by the signs given above.

When the inflammation is seated at the surface of the liver constituting the *sero-hepatitis* of one writer, (*G. H. Bell*), the pain is more severe than when it exists deep in the parenchyma of the organ, constituting the *puro-hepatitis* of the same writer. This has been laid down as an illustration of a general law, “that if we consider inflammatory affections of the solid viscera, we shall find that the more superficial the inflammation the more painful it is; and, on the other hand, the more deep-seated it is, the more is it latent, so far as pain is concerned.” (*Stokes*.) The author, above-mentioned, (*Bell*), states, that in the *sero-hepatitis* of India, the patient is attacked with sudden pain in the region of the liver, and this is so severe, that even the weight of the bed-clothes is insupportable, nor can he bear to turn or lie on his left side owing to the pressure exerted in that position on the inflamed organ. But in the *puro-hepatitis*, the affection may proceed in such a latent manner, that the first symptoms of liver disease may be those of suppuration. This assertion has been confirmed by the experience of others, (*Annesley*), and by a succession of cases of hepatic abscess, which were under treatment at the Meath Hospital in 1828. (*Stokes*.)

Acute inflammation of the liver may terminate in various ways. Like all acute phlegmasiæ, it may pass off by resolution, or end in suppuration or gangrene, or proceed to the chronic state. When it terminates by resolution, the symptoms gradually disappear, and if percussion over the region of the liver had shown the existence of dulness of sound over a greater extent of surface than in health, successive percussions will now show that the enlargement of the liver is gradually subsiding. When the inflammation is about to end, or has ended, in suppuration, the fever becomes hectic; the hepatic tumour continues, or even becomes augmented in size; a feeling of increased weight is complained of in the region of the liver; and where adhesion has taken place between the peritoneal coat of the organ and the peritoneum proper, the matter may make its way towards the surface, and fluctuation, with decided pointing, be perceptible. This is the ordinary course of the formation of

hepatic abscesses with us; but, occasionally, even in temperate climes, the abscess forms rapidly, and with symptoms which might seem to belong to the early stage of the disease. (*Stokes.*)

The most prevalent form of acute liver disease, in Bengal, is inflammation, with tendency to central abscess. A very common symptom of the incipient stage of this tendency in the right lobe of the liver is said to be,—a much greater degree of tension of the right rectus abdominis muscle, than of the left; the muscle on the right side resisting pressure by a quick involuntary action, whilst the left rectus is lax, and other parts of the abdomen of the patient are comparatively soft and elastic. (*Twining.*) Mr. Twining considers this one of the most undeviating symptoms of congestion, with incipient interstitial deposit into the texture of the liver, which commonly goes on to deep-seated abscess, unaccompanied by urgent signs of pain or pyrexia. In these cases, suppuration will often be established, when it is not indicated by any symptoms except those that are present in the early stages of hepatitis.

Unless the abscess makes its way externally through the parietes of the abdomen, or through the stomach, duodenum, colon or air passages, suppuration of the liver is almost always fatal. The termination in gangrene is very rare, and is always rapidly fatal. It is announced by the sudden cessation of pain, sinking of the pulse, cold clammy sweats, coldness of the extremities, hiccough, and rapid alteration of the features. (*Andral.*) This mode of termination has, however, been called in doubt, (*Rostan, Mackintosh,*) yet it unquestionably occurs occasionally. (*Andral, Stokes.*)

Causes.—Excessive heat unquestionably predisposes to hepatitis; hence it is, that the disease is much more common in the torrid regions of the globe, than in the temperate or frigid. Excessive heat, alone, produces erethism of the mucous membrane of the stomach and intestines,—as has been elsewhere remarked—and this erethism is readily propagated to the liver. The mode in which the livers of the geese are enlarged, at Strasburg and Metz, with the view of forming the *patés de foies gras* is illustrative of this subject. They are crammed up to the neck with food, are nailed to a board, and exposed to the heat of a strong fire, until, with the aid of punctures made through the parietes of the abdomen, until the needles penetrate the liver, but more frequently without this last refinement of cruelty, the livers are enlarged to correspond with the desires of the gourmand. (See the author's *Elements of Hygiène*, p. 49.) The heat is, doubtless, in this case, a predisponent, by enervating the digestive organs, whilst the enormous quantity of aliment excites the stomach and duodenum, and from these the excitement is conveyed to the liver. It can hence be understood, that in the torrid regions of the globe, repletion of any kind, and especially by stimulating aliments, may be likely to induce the affection under consideration; yet where hepatitis prevails to an unusual degree, local influences must be combined with elevated temperature in the causation. This is proved by the fact,

that the average annual per centage of hepatitis, in the East Indies, is at least treble what it is in the western hemisphere. (*Annesley.*) It would appear, too, from the statistical report of the British troops in the West Indies, that although diseases of the liver are by no means so common amongst the troops in that service as amongst those employed in the tropical regions of the eastern hemisphere, they are nearly three times as prevalent as amongst troops in Great Britain and Ireland, and occasion about five times as high a rate of mortality. Yet, what confirms, again, the influence of locality in addition to elevated temperature, those diseases vary materially in prevalence and severity, at different stations in the West Indies,—occasioning, at Grenada, for example, three times as great a mortality as at most of the other islands. In Jamaica, notwithstanding the high degree of atmospheric heat, they are by no means very prevalent or fatal, and many parts of the island are remarkably exempt from them. It would seem, too, from the statistical report, that the mortality in the West Indies, from these diseases, is much less amongst the black than amongst the white troops. (*Wm. Thomson.*)

In certain parts of the globe, and especially in the East Indies, the causes are of such universal application, that hepatic disease in animals is by no means unusual. Animals, carried to India from more temperate climes, are peculiarly subject to it, and many of them die. (*Stokes.*) Staff-surgeon Blest informed Dr. Stokes, that he had seen many cases of hepatic abscess in dromedaries and horses under these circumstances.

In temperate climates, the most common causes of acute hepatitis are such as act mechanically on the liver: for example, blows on the right hypochondrium, great efforts to raise heavy weights, falls from a height, and penetrating wounds. The hepatitis, thus induced, is almost invariably fatal. For the reasons before mentioned, it will be readily understood, that any excessive irritation of the stomach and intestines may cause it; hence, it is a result of hyperemesis and hypercatharsis, and of gastro-duodenal inflammation, which may be propagated along the biliary ducts, as already remarked, and also—it has been conceived (*Ribes,*)—by the veins, which arise from the stomach and intestines, becoming inflamed, and the inflammation extending along the vena porta to the liver. Inflammation of the rectum has, in this way, been observed to reach the liver, and to induce numerous abscesses in that viscus. (*Cruveilhier, Andral.*)

Like other phlegmasiæ, hepatitis would seem to be induced by irregular exposure to cold; and it is asserted to have succeeded to the percussion of some cutaneous or other irritation or discharge. Europeans, who have recently arrived in India, are very liable to liver disease from slight exposure to atmospheric vicissitudes, or to the common causes that induce fever in Europe or this country. (*Twining.*)

Habitual intemperance, or dram-drinking, according to the ex-

perience of Mr. Twining, is not as common a cause of hepatitis as has been supposed, (*Mills*,) and it has been affirmed, that, in our own climes, it produces disease of the stomach more frequently than that of the liver. (*Mackintosh*.) The author has extensive opportunities for observation on this matter at the Philadelphia Hospital, and although he may agree with the writers cited, that acute hepatitis is not common, his whole experience leads him to the assertion, that inveterate habits of drinking spirituous liquors produce death, not by their effect upon the stomach alone, but by the chronic inflammation, and other diseases of the system of nutrition of the liver. The mode of causation is sufficiently evident. The alcohol irritates, and often inflames the lining membrane of the stomach and duodenum, so as to give rise to softening, thickening, and the other results of chronic gastro-enteritis, and the effects of these pathological states are extended along the ducts to the liver, which becomes morbidly implicated. Along with this chain of causation, the alcohol passes readily through the coats of the veins of the portal system, by endosmose; and, before it becomes well mixed with the blood of the vena porta, it is distributed through the liver, whose organic actions cannot fail to be unduly excited, and often perverted under the stimulation. It has been observed, by an excellent writer on the diseases of the liver, (*Wm. Saunders*,) that in dram-drinkers, the diseased structure may often be traced from the stomach along the ductus communis choledochus, and that the gall ducts may be so contracted and thickened, that they cannot transmit the bile.

Acute hepatitis is not a disease of infancy. (*Billard*.) With regard to its comparative frequency in the two sexes, discordance of opinion exists. Whilst some, (*Andral*,) affirm, that females are rarely affected by it; others (*Mackintosh*) assert, that, in Great Britain, women are more liable to diseases of the liver than men, owing, probably, to their sedentary occupations. In India, again, it is affirmed, (*Twining*,) that women are less liable to acute liver disease than men of a corresponding class of society, owing to their more temperate habits of mind, as well as to less exposure to the exciting causes, and more abstemious method of living.

Pathological characters.—Some difference of sentiment has existed as to whether the liver is augmented in size in acute hepatitis. It has been affirmed, that no increase is perceptible, (*Martinet*,) but others, and the generality of observers, have maintained the contrary. (*Andral*.) The truth is, that but few opportunities have presented themselves for observing the pathological appearances in acute hepatitis. Generally, perhaps,—especially in the first stage or that of congestion or engorgement,—there is enlargement; but it must be borne in mind, that the liver is, at times, very large in persons, who are unaffected with hepatitis; and if such persons were to complain of symptoms referable to the liver, this increased development of the organ might receive greater attention as a means of diagnosis than it merits. There are cases

in which, to employ the language of a writer on this subject, (*Stokes*), "there exists, in adults, a persistence of the embryonary condition of the liver." This condition—it is presumed, by the writer cited, and properly we think—is one of the varieties of arrest of development, and is observed in those persons, whose constitutions give manifest indications of scrophula. This fact exhibits the importance of having a correct knowledge of an organ, when in its healthy state, before we can accurately appreciate the pathological appearances; and perhaps we are scarcely justified in indicating any other *post mortem* appearances, as of general occurrence in acute hepatitis, than those of hyperæmia in the earliest stage; of redness with softening; and, at a later period, of infiltration or collections of pus, when the inflammation has ended in suppuration. These collections vary greatly in size and number; at times, they are not larger than a hazel-nut; at others, they occupy one half of the viscus. They may be seated near the circumference of, or deep in, the organ, and are usually surrounded by redness, and softening of the hepatic parenchyma.

Frequently, the liver is found to have contracted adhesions with the neighbouring parts;—the diaphragm, stomach, duodenum, colon or the parietes of the abdomen;—the peritoneum serving as the bond of union, through which the matter of abscesses at times makes its way to be discharged externally. At other times, the pus is found in the cavity of the peritoneum, where it has excited fatal inflammation.

Tubercular degeneration, in a state of softening, has not unfrequently, perhaps, been mistaken for abscess of the liver. (*Mackintosh*.) Gangrene of the liver, it has been already remarked, is extremely rare.

Treatment.—As in all cases of active inflammation of internal organs, bleeding is a most important remedy, pushed to such extent, and repeated as often, as the symptoms indicate, and the habit of the individual will justify. There is considerable tolerance of loss of blood, and this, indeed, has been regarded as a useful diagnostic. (*M. Hall*.) In the early period of the disease, the decisive use of the lancet is important, yet it is not often cut short by it, (*Stokes*;) it is, however, mitigated in violence, and the diminution of the quantity of the circulating fluids prepares the way for other remedies.

When the disease is too far advanced, the application of leeches is to be preferred, and after they have dropped off, a warm emollient poultice may be placed over the bites. The leeches may be applied again and again, should circumstances indicate the necessity. If the patient has been liable to hemorrhoids, or if there is reason to believe, that the inflammation is seated at the concave surface of the liver, some of the French practitioners prefer, that the leeches should be applied around the anus; and this form of revulsive bleeding, the author has found advantageous in all cases of hepatitis. (*Conwell*.)

Drastic purgatives are of questionable utility. It has been already remarked, that irritation of the lining membrane of the intestines is readily communicated to the liver, and hence, any therapeutical agent, that will greatly stimulate the canal, and especially its upper portion into which the biliary ducts open, may add to the hepatitis. Cathartics, however, like the salines, which act on the whole tract, and increase the secretion from the lining membrane, without producing too much irritation, are of decided advantage. When the inflammatory symptoms have been reduced by the vigorous employment of antiphlogistics, counter-irritants—as blisters—may be applied over the region of the liver, and the prolonged use of the warm bath be prescribed.

It has been a common custom, borrowed from the practice of the physicians of India, to administer mercury largely, so as to induce salivation. Some commence this at the very outset of the disease; but if it be employed at all, it should be prescribed after the inflammation has been reduced by antiphlogistics; its revellent operation may then be of decided benefit.

When the hepatitis has terminated in suppuration, and the abscess is deep-seated, nothing can be done, excepting to meet the general symptoms, and support the individual—if this be necessary—by appropriate diet. Should, however, the collection of matter be superficial, it will be necessary to open it, as soon as practicable, if there be reason to believe that it is making its way by adhesion to the surface of the body, and if there be no likelihood, that if an incision be made, the matter will be discharged into the cavity of the peritoneum. This is not easily diagnosticated, inasmuch as it has been found, that an abscess of the liver may be so large as to form a distinct tumour on the surface, which may be fluctuating, discoloured and painful, and yet, on dissection, there may not be the slightest trace of adhesion; so that, if paracentesis had been performed, the matter must have made its way into the peritoneum, and been the cause of death. (*Stokes, Graves, Annesley.*) Where doubts exist as to whether adhesions have formed, so as to render it safe to open the abscess in the ordinary manner, the plan, proposed by a distinguished physician, (*Graves,*) may be adopted. It consists in making an incision down to the peritoneal coat of the liver, and filling the wound with lint. This will be followed by the requisite adhesions, and the abscess will probably advance towards the part where the incision is made. (*Stokes, Twining.*) When patients have not permitted the abscess to be opened by incision, the potassa has been applied to the most prominent part of the tumour, (*Twining;*) but there does not appear to have been any advantage from this mode of procedure. On inspecting the bodies of those individuals after death, adhesions of the peritoneal coat of the liver to the parietes of the abdomen have very rarely been found.

Where the abscess bursts into the cavity of the peritoneum, the case has to be treated in the same manner as peritonitis, produced by rupture or perforation of the intestine.

Care must be taken not to mistake a distended gall bladder for an abscess. (*Vavasseur.*) This may be done. An interesting case is on record in which the gall bladder was actually punctured, under the idea that the tumour formed by it was an abscess. (*Stokes and Graves.*)

It has been attempted to induce absorption of the pus by mercury, pushed so as to induce salivation. This, however, is not always easy. It has, indeed, been found, in many instances, impracticable to salivate persons labouring under hepatic abscess, so that it has even been conceived, that the presence of matter in the liver may be determined, in doubtful cases, by the circumstance of the patient being unsuspceptible of the full effect of mercury. It is indeed difficult to induce ptyalism when the organic actions are greatly excited in any part of the economy.

Throughout the whole of the period of activity of the inflammation, the diet must be strictly antiphlogistic; but when the violence of the disease has subsided, mild farinaceous aliment may be allowed, with milk or chicken broth, unless these articles disagree; in such case, one-sixth part of cream, mixed with five-sixths of water, forms an agreeable and nutritious aliment. To allay the thirst, it is best to allow small pieces of ice to be taken into the mouth frequently. Where large quantities of fluid are permitted, especially when bleeding, general or local, has been premised, so as to diminish the quantity of blood circulating in the vessels, the fluid passes readily through the coats of the stomach and of the veins of the organ, so that in a short time after the bleeding, the portal system may be as full of fluid as it was previously.

b. *Chronic Inflammation of the Liver.*

SYNON. Hepatitis chronica, Inflammatio Hepatis lenta, Hepatitis occulta; Chrono-Hépatite. (*Piorry.*)

It has been properly remarked, (*Twining,*) that many of the cases, usually denominated "chronic hepatitis," differ rather in degree, than in any other essential, from the acute form of the disease; and that they require more perseverance in the use of remedies, although the same active treatment may not be so necessary as in acute cases. There can be no doubt, however, that "liver disease"—as it is commonly called—is by no means as frequent as was at one time supposed; and that many of the morbid conditions, which were looked upon as hepatic, are really gastric or duodenal.

Diagnosis.—The symptoms are essentially like those of acute hepatitis. There is a dull, heavy pain in the right hypochondrium, increased by pressure, by succussion of the body, or by lying on the left side; and it may not be felt except under these circumstances. These symptoms are accompanied by more or less fever, which occasionally has a marked exacerbation in the evening. Sooner or later, the skin usually becomes more or less yellow; the fæces white, or clay-coloured, and the urine brown or yellow, depositing a copious sediment. By pressing upon the abdomen, after

the inflammation has persisted for some time, the liver may be felt extending beneath the false ribs, and more or less towards the epigastric and the umbilical regions; and, frequently, the right hypochondrium is observed to be manifestly more tumid than the rest of the abdomen. Percussion indicates the existence and extent of this tumefaction. Along with these symptoms, there is generally yellow, furred tongue; want of appetite; nausea and vomiting; and, at times, diarrhœa; in short, disordered function of the stomach and the whole intestinal tract. These are the symptoms usually assigned, and which belong, to chronic hepatitis; but they equally belong to other chronic liver diseases, to be described presently. Many of the symptoms, again, may be absent; nay, few—if any—of them, may be present, and yet chronic hepatitis may, notwithstanding, exist. The pain in the hypochondrium may be the only symptom. It is said, indeed, that nothing but great itching of the skin may lead to a suspicion of its presence, (*Andral*;) whilst others assign an eruption, attacking the face and back between the shoulders, generally in the form of acne, as one of its symptoms, (*Mackintosh*;) but neither of these cutaneous affections is deserving of much weight, especially when taken singly.

Chronic hepatitis may also be confounded with disease of the neighbouring viscera—as scirrhus of the pylorus, chronic disease of the duodenum, and of the pleura when accompanied by effusion; and it may be complicated with one or more of these affections, so as to render the diagnosis very difficult.

It is stated on excellent authority, (*Andral*;) that chronic hepatitis frequently terminates in suppuration, which, in a very great number of cases, occurs without being suspected by either the patient or the physician; whilst, in other cases, it is foretold by the symptoms mentioned under acute hepatitis. The author has never met with a case of the kind; and, consequently, such a termination, in these climes, must be extremely unfrequent.

Causes.—These are essentially the same as those of acute hepatitis.

Pathological characters.—The appearances on the cadaveric examination of a person, who has died under chronic hepatitis, are varied. The most constant is the increased size of the liver. (*Andral, Bonnet*.) The texture of the viscus is variously changed. Usually, it is indurated, more dense, but more readily lacerable. The colour, too, may differ: it may be brownish, reddish-yellow, slate-coloured, or blackish, in spots or patches. Abscesses may be found, and the same kind of adhesions may exist with the neighbouring parts as in acute hepatitis. Along with the evidences of chronic hepatitis, tubercles, melanosis, cirrhosis and the different degenerations, to be described hereafter, may be met with. (*Andral*.)

Treatment.—The management of cases of chronic hepatitis is analogous to that of the acute form. Whatever excites the lining membrane of the stomach and bowels, whether in the way of ali-

ment or medicine, must be sedulously avoided; the plan, consequently, of administering cathartics repeatedly, which are reputed to be cholagogue in their action—or which, in other words, excite the lining membrane of the upper portion of the intestinal canal, is objectionable. The diet must be carefully regulated; leeches and emollient cataplasms be applied to the hypochondriac region, or to the anus, from time to time; gentle laxatives be administered; with counter-irritants,—as blisters, the tartarized antimony ointment, or frictions with the croton oil; and the warm-bath. This plan of treatment, carefully persisted in, will often be entirely successful, but should it fail, revellents of another kind may be demanded. Mercury then becomes advisable, which may be administered either internally,¹ or by way of friction, until the effects of the remedy become perceptible on the mouth.

¹ R.—Pil. hydrarg. gr. iij—v.
Every night at bedtime.

Or, R.—Hydrarg. chlorid. mit. gr. j.
Ext. taraxac.
— hyoscyam. āā gr. ij.—M.

If blisters have been employed, the blistered surface may be dressed with mercurial ointment. The author has never found it necessary to push the mercury beyond this point; but actual salivation has been recommended, should the pain continue to be severe, the swelling undiminished, the symptoms obstinate, and no contra-indication—as the presence of scrophula—coexisting. (*Stokes.*)

It is proper, by the way, to remark, that in the opinion of certain observers, (*Saunders, Nicholl,*) hepatitis and other diseases of the liver may be induced by mercury, and that in venereal establishments, hepatitis and jaundice have not unfrequently been seen to follow the use of the remedy.

As a revellent, capable of being substituted for mercury in these cases, the internal and external use of chlorine has been advised. Favourable results were obtained from the administration, internally, of the aqua chlorini, in the Children's Hospital of St. Petersburg. (*Riecke*, and the author's *New Remedies*, 3d edition, p. 142, Philad. 1841.) When the external agency of the chlorine is desired, the nitro-muriatic acid is commonly employed,—bathing the feet, or sponging the right hypochondrium with it. The form, usually advised, is the following, (*Annesley,*)—

Take of strong nitric and muriatic acids, of each, four ounces: add to these eight ounces of water. Of this mixture, take from two to five ounces, and dilute with three gallons of warm water. When this is used in the form of a pediluvium, the patient should keep his feet in it for 20 minutes or half an hour. If the bath be of proper strength, it will cause a prickling sensation in the skin. Should it not do so, an ounce or two more of the acid mixture may be added to it. (*Scott.*)

Fumigations of chlorine have a similar agency; and they have been regarded as more certain than ablutions and baths of nitro-muriatic acid. (*Wallace, Zeise.*) When the chlorine is used in this way, it also occasions a prickling sensation; increase of transpiration; great afflux of fluids to the surface of the body; and, at

times, a pustular eruption; increased secretion of saliva, urine and bile; slight inflammation of the mouth and fauces, &c. It is evident, from this active revellent operation, that the application of chlorine may be serviceable in many diseases, as well as the one under consideration. It has been considered peculiarly adapted for cases of chronic hepatitis, in which mercury has been used irregularly, or for a long period, without benefit; or, where the patient is of a broken down constitution, and the practitioner is anxious to dispense with the use of mercury. (*Stokes, Sir James M'Gregor.*)

A strict observance of hygienic rules is all important in this disease. The diet should be unirritating, but moderately nutritive; and as there is generally a desire for fruits and acidulous or acid substances, the taste may be indulged under due precautions. Lemonade forms an agreeable and proper drink. Moderate exercise may be allowed, with travelling air, and exercise properly adapted to the case. Mineral waters have been advised,—as the Harrowgate or Cheltenham,—or, in other words, the sulphurous or saline class. (*M. Hall.*) The trans-allegany springs of Virginia, furnish sufficient variety; as well as the Fauquier springs, and those of Saratoga; but the waters are not of the efficacy, in such cases, that has been supposed, and, by disagreeing with the gastric and intestinal organs, they may do positive mischief. The revellent effect of change of air, scenery, and society is unquestionably calculated to be advantageous in long protracted cases of chronic hepatitis, but care should be taken, that the change should be to a situation in which the patient can rigidly follow the regimen, adapted to his case; otherwise, the resulting evil may more than counterbalance the good. (*Bonnet.*)

III. HYPERTROPHY OF THE LIVER.

SYNON. Hypertrophia hepatis; *Fr.* Hypertrophie du Foie, Hyperhépatotrophie, (*Piorry*); *Ger.* Hypertrophie der Leber, Uebernahrung der Leber.

Under acute and chronic hepatitis, it was observed, that the liver, owing to hyperæmia, is sometimes greatly enlarged. This is not, however, a case of hypertrophy of the liver. The latter term is applied to augmentation of size, resulting from increase of the tissue of the organ.

Diagnosis.—The symptoms of hypertrophy of the liver vary, according as the affection is general or partial, and according to the part of the organ that is hypertrophied. If the whole liver be enlarged, a tumour will exist in the right hypochondriac region, and the liver may be detected, both by palpation and percussion, beneath the false ribs; and may, or may not, be painful on pressure. Where pain is present, it appears to be owing rather to the traction of the peritoneum than to the condition of the liver itself. The disease is slow in its progress, and may produce more or less disturbance of the digestive function. It has been asserted, that it never proves fatal of itself, (*Andral,*) but it is easy to see, that it may readily induce other affections, which may destroy life.

It has been affirmed, that, in certain cases of enlarged liver, a loud sound is heard through the stethoscope, "between a crepitous rattle and a bleating, and accompanied by a vibration of the parietes of the thorax, communicated to the hand applied to the part." (*G. Malcolmson.*) In one case, it is said, such a sound was caused by the thin edge of the lung being compressed against the costal pleura by an enlarged liver; and, in another, Mr. Malcolmson was able, "by placing the patient in a sitting posture, to remove the symptom, and to let the lung descend a little farther into the chest, and, by pressing the liver forcibly upwards, again to produce it."

Causes.—It is not easy to assign a cause for the increase in the nutritive acts of the liver. In the fœtus, and the infant, a state of hypertrophy of the organ may be esteemed natural; but the proportion diminishes gradually after birth. It has been already observed, too, under hepatitis, that there are certain persons in whom the change does not take place, and who grow up with the liver bearing the same proportion to the other organs as it did in the foetal condition. (*Stokes.*) Such individuals are generally of a strumous habit. (*Andral.*)

Pathological characters.—Hyperæmia of the liver may coëxist with various colours of the organ, and with different degrees of consistence. When the liver is hypertrophied in every part, its shape may be preserved; but, in other cases, it may be variously modified. Generally, the hypertrophy is seated in the right lobe; but it may occur in any part of the organ. Various cases of excessively enlarged liver are on record, but few, if any, were examples of simple hypertrophy. When the hypertrophy has been accompanied by disease, the organ has weighed as much as twenty, and even twenty-eight, pounds. (*Gooch, Professor Gross, of Louisville, Colling, Nicolai, Heyfelder.*)

Treatment.—It is not an easy matter to remove the derangement of functions, which gives rise to a loss of balance between deposition and absorption. As the disease, however, is usually associated with scrophula or defective development, it is not advisable to place the patient on too severe a regimen, or to reduce him by powerful remedies. The preparations of iodine would seem to be indicated: they have been used accordingly, and it is said with much advantage. It may be given internally,¹ or be rubbed over the region of the liver night and morning.²

¹ R.—Tinct. iodin., seu
Tinct. iodin. comp. (Pharma-
cop. Lond.) gtt. x., ter die.

² R.—Iodin. ʒss.
Adipis, ʒi.—M.
Quantity, the size of a hazelnut.

IV. ATROPHY OF THE LIVER.

SYNON. Atrophia hepatis; *Fr.* Atrophie du Foie; *Ger.* Atrophie der Leber.

Defective nutrition, like supernutrition of the liver, may affect the whole, or a part only, of the organ. It may likewise exist alone from causes affecting the intimate nutrition of the liver, which are not appreciable; but, most commonly, it is associated with induration or softening.

Atrophy of the liver is understood by pathologists to mean atrophy of the proper substance of the viscus. This may disappear without the whole organ being less; it may, indeed, be larger than natural, owing to the circumstance, that as the proper substance of the liver disappears, it is replaced by cellular tissue. (*Andral*.)

This disease of the liver is usually slow in its progress. The patient may, or may not, complain of more or less uneasiness in the region of the organ; his nutrition falls off; the gastric functions are imperfectly executed; the abdomen increases in size; and symptoms of ascites become developed, and exist as long as the individual lives. The ascites is owing to the obliteration of some of the portal and hepatic vessels in the progress of the atrophy, and it is one of the common accompaniments of the affection.

The existence of atrophy of the liver may be suspected by the presence of the symptoms above mentioned; but the diagnosis must necessarily be imperfect; and if it were easy, it would be difficult to suggest any rational plan of management.

V. SOFTENING OF THE LIVER.

SYNON. Hepatomalacia, Malacosis hepatis, Softening of the Liver; *Fr.* Ramollissement du Foie; *Ger.* Erweichung der Leber, Lebererweichung.

Ramollissement of the liver may exist in different degrees, so as not to be perceptible, except on pressing the parenchyma between the fingers; or to such an extent as to be appreciable by simple inspection;—the tissue of the liver, in the latter case, being liquefied, as it were, and having the appearance as if it had been long subjected to maceration. The sort of red or gray pulp, to which the substance of the organ is reduced, permits the different vessels, distributed through it, to be distinctly seen, owing to their being deprived of their means of union.

The softening may exist without any change in the colour of the organ; but, in certain cases, it is black, and has the appearance of grumous blood. (*C. A. Lee*, of New York, *Professor Gross*, of Louisville.)

In some cases of softening of the liver, the organ is of the natural size; in others, it is larger; and in others, again, smaller; and it may affect the whole organ, or only a part of it. It has no diagnostic symptoms, and is a rare affection.

VI. INDURATION OF THE LIVER.

SYNON. Induratio hepatis; *Ger.* Leberverhärtung, Verhärtung der Leber.

When the liver is indurated, it usually exhibits, when torn, a granulated surface. This condition, like softening, may exist with the natural, augmented, or diminished size of the organ; but, generally, the bulk of the gland is much reduced, sometimes nearly to one half. Its colour may be various—brown, red, or green, (*Andral*;) and sometimes it is purple, or lilac. The granules become atrophied—as described under the head of Atrophy of the liver—and, in some cases, they seem to be wholly removed, their place being occupied by cellular tissue, which gives the organ

the dull grayish colour. Such a state cannot exist without the obliteration of many of the hepatic vessels and ducts, which may give occasion to ascites, (see *Atrophy of the Liver*,) and to yellowness of the conjunctiva and the surface of the body. These symptoms cannot, however, be esteemed pathognomonic.

As the presence of either softening or induration of the liver can only be suspected, the treatment will have to be regulated upon general principles. Both conditions have been supposed to be the results of chronic inflammation. They are certainly lesions of nutrition, but not necessarily connected with an inflammatory process, and certainly not with one, which is indicated by the usual symptoms.

VII. CIRRHOSIS OF THE LIVER.

SYNON. Cirrhoneosis, Kirrhosis or Kirrhonosis of the Liver, Granulated, Granular, Mammillated, Tuberculated Liver; *Fr.* Cirrhose du Foie; *Ger.* Cirrhose der Leber.

This affection, so called from the yellow colour of the liver, (*κίττος*, "yellow,") like the last described, is more interesting in its pathological than in its therapeutical relations.

Diagnosis.—There are no symptoms, which can lead to more than a suspicion of its existence, and when such symptoms are present, they are equally referable to induration and to atrophy of the organ. The region of the liver may afford no symptoms or signs; ascites, however, appears to be a universal concomitant, and commonly œdema of the lower limbs also,—the latter succeeding to the former. When the reverse is the case, it is affirmed, that Bright's disease of the kidney or disease of the heart is always indicated. (*Becquerel*.)

The dropsical effusion into the abdomen usually occurs slowly; and if it should take place to such an extent as to require paracentesis, it is quickly re-established after the operation. In some cases—it has been estimated in about one third, (*Littré*,)—jaundice coexists; but in other cases, there is simply a yellow tint of the skin and conjunctiva. It has been affirmed, indeed, that icterus is not one of its concomitants or consequences, (*M. Hall*;) but this is an error. In process of time, the nutrition of the body becomes so much affected that marasmus is established, and the individual gradually sinks.

Causes.—The most common cause of this, as well as of every chronic disease of the liver, is the abuse of spirituous liquors. In all of the few cases of cirrhosis, which have fallen under the author's care, the subjects have been dram-drinkers, and this accords with the experience of others. (*Hope*.) It can be understood, however, that other affections of the liver,—hyperæmia, chronic hepatitis, &c.—may lead to the same result. A recent writer (*Becquerel*), conjectures, that it may arise from active and long-continued congestion of the liver, consequent upon chronic disease of the lungs or heart,—with the affections of which organs, cirrhosis is often complicated.

The immediate causes of the disease are, however, unknown. It appears to be met with more frequently in men than in women. Of 18 cases of the simple or uncomplicated form of the disease, 12 occurred in males, and 6 in females; and, in regard to the influence of age, the cases may be thus arranged—

Between	18	and	20	years,	1
“	20	“	30	“	2
“	30	“	40	“	7
“	40	“	50	“	3
“	50	“	60	“	5
					—
					18

It would hence appear, that persons between 30 and 40 are more liable to cirrhosis. It is also met with in children; and a writer, already cited, (*Becquerel*), is disposed to think, that it occurs more frequently in young subjects than has been generally supposed.

Pathological characters.—Pathologists do not agree as to the nature of the change of structure in cirrhosis. The disease consists essentially in the development of granulations of various sizes, both at the surface and in the very substance of the liver. These granulations may not be larger than shot of the largest size; but, at times, they are as big as cherries. The form of the liver is always more or less changed; commonly, it is much less than natural, and shrivelled, as it were,—its tissue being denser than in the healthy condition. The granulations are of different colours,—red, brown, but more commonly yellow—and, at times, of a beautiful canary yellow. By the eminent pathologist, (*Laënnec*), who first described this morbid state, these granulations were supposed to consist of a peculiar tissue, which, as it was developed, gave occasion to the absorption of the proper tissue. This tissue,—*Laënnec* conceived, like some other accidental tissues, had two stages,—the crude and the softened. The views of *Laënnec* have not, however, been generally admitted. (*Bouillaud*, *Andral*, *Cruveilhier*.) The two former pathologists, believing the liver to be formed of two distinct substances—the yellow and the red—are disposed to refer the lesion to an hypertrophied condition of the yellow substance,—the red becoming, at the same time, atrophied, hence the mammillated appearance which is presented by the yellow substance. *M. Cruveilhier*, on the other hand, does not admit, that the granules are formed of two distinct substances. His views of cirrhosis are,—that it consists essentially in atrophy of the greater number of the granulations, and hypertrophy of the remainder to supply the deficiency thereby engendered. The two distinct substances in the liver,—the yellow, the secreting tissue,—and the red, formed by the ramifications of veins and arteries—are, however, by no means generally admitted, (*Kiernan*;) and until they are established, any view, founded upon them, cannot be implicitly received.

The opinion of *Laënnec* has appeared to the author to be most

entitled to favour; and the circumstance that, in certain forms of cirrhosis, little granules, having the appearance of adipocire, can be washed out of their cellulo-fibrous capsules, after a maceration of some days in water, is greatly in favour of their adventitious formation.

The following case, which fell under the author's care, and was reported at length by a then resident physician of the Philadelphia Hospital, (*Edwin A. Anderson*, of Wilmington, N. Carolina,) will illustrate the general character of cases of cirrhosis.

A woman, aged 65 years, was admitted into the hospital on the 31st of July, 1838. She had been in the habit of working in the open air, at gardening, and had been subject, for three years, to palpitation and severe attacks of dyspnœa, which continued for ten or fifteen minutes. She also had cough, attended with expectoration in the morning, and profuse sweating at night, for a long period. Her appetite was bad, and her habits were very intemperate. A month previous to her entrance into the hospital, she had an attack of pleurisy of the left side, for which she was bled and purged. An attack of inflammation of the uterus supervened on the pleuritis, followed by extensive infiltration of the upper and lower extremities, and effusion into the thoracic and abdominal cavities. The effusion into the thorax was so extensive, that, according to the voluntary account of the patient, when she suddenly moved or rose from bed, she was sensible of a body of water rushing from one part of the chest to another.

The day after her reception into the hospital, (Aug. 1,) she was labouring under excessive dyspnœa, which obliged her to assume a semi-recumbent posture; the lips were pallid; the skin was of a deep yellow hue, and the conjunctiva was of the same colour. There was extensive infiltration of the upper and lower extremities; the abdomen was distended, and presented very evident fluctuation; and the lower portions of both pleuræ were dull on percussion. Soon after her admission, she was attacked with delirium tremens, and sank under her complication of diseases on the 6th.

On examining the abdomen, the liver was found much enlarged, weighing about ten pounds; granulated, the surface raised into a number of round mammillated protuberances, of a tawny colour, closely resembling beeswax, none of them larger than a pin's head: the substance of these granulations was compact, and when divided, they presented a smooth, flat, even surface. The consistence of the liver was very firm, admitting the finger with much difficulty; semi-cartilaginous, and evidently greasing the scalpel when cut into. The whole organ presented an excellent example of cirrhosis combined with hypertrophy,—not with diminution of bulk, as defined by Laënnec.

The gall-bladder contained a dark coloured bile. The stomach presented, along its great curvature, a highly injected state of vessels; and the mucous membrane could be readily detached. (*Dunglison's American Medical Intelligencer*, vol. i. 1838, p. 199.)

These were the most marked appearances, and the most interesting in their application to the subject under consideration.

Cirrhosis never affects the liver partially; but attacks almost all its substance simultaneously. (*Becquerel.*)

VIII. MELANOSIS OF THE LIVER.

SYNON. Melanosis hepatis; *Fr.* Mélanose du Foie; *Ger.* Melanose der Leber.

This affection is not common; yet many cases of it have been recorded, (*Morgagni, Laënnec, Cruveilhier, Carswell;*) and it has been affirmed, that the liver and the lungs are the only organs, in which melanotic tumours, of the encysted character, are liable to become softened, their contents to be discharged, and to leave after them excavations similar to those left by pulmonary tubercles. (*Laënnec.*)

The opinions of pathologists have differed in regard to the modifications induced by melanosis of the liver. Thus, it has been affirmed, (*Martin Solon,*) that numerous and considerable melanotic tumours may exist in the liver, without inducing any unusual symptoms. On the other hand, anasarca, emaciation and prostration have been ascribed to them. (*Laënnec.*) The condition is rather of pathological than of therapeutical interest, inasmuch as it cannot be diagnosticated during life.

IX. FATTY DISEASE OF THE LIVER.

SYNON. Fatty liver, Adipous or Fatty degeneration of the liver, Adiposis of the liver, Adiposis hepatica, Pimelosis hepatica; *Fr.* Dégénérescence graisseuse du Foie.

The liver, in a state of health, contains a certain quantity of fatty matter; and the cholesterine, which is secreted by it, is of the same character. It can be readily seen, therefore, that under certain modifications of the functions of nutrition of the liver, the quantity of fatty matter may become augmented, so that we may have a state of hypertrophy of the fatty substance, as we have of the cellular membrane.

The portions of the liver that contain the fatty matter, resemble in colour a dead leaf, figured, irregularly with brownish or deep orange spots. (*Addison.*) Internally, it has a somewhat corresponding appearance, excepting, that the brown and pale yellow tissues are much more uniformly distributed than upon the surface. Their consistence is diminished; and they give no evidence of the presence of the colouring matter of the blood.

When they are cut into, the appearance of grease is evident on the scalpel; and, by boiling, the oily matter can be separated. This is, at times, small in quantity; but at others it would seem to occupy more space than the parenchyma of the organ. This was the case in a liver examined by a chemist of distinction. (*Vauquelin.*) One hundred parts were found to consist—of oil, 45 parts; parenchyma, 19; water, 36. The oily matter has been examined more recently. (*Golding Bird.*) It is a soft brownish substance, possessing a peculiar and disagreeable odour. A pound of the tissue of the liver

has been found to yield about five drachms and a half, but—as before remarked—the quantity must vary according to the extent of the disease.

Sometimes, the fatty liver does not exceed the natural size: at others, it is greatly enlarged. It has been seen to extend beyond the brim of the pelvis; and, in one instance, to weigh 16 pounds. (*Mackintosh*.) In all cases it is of less specific gravity than healthy liver, the ratio, in two specimens, being as 1.027 to 1.062. (*G. Bird*.) In one of the cases cited, (*Mackintosh*), large sections of the liver floated even in strong alcohol. At times, the depositions are partial, and are surrounded by sound hepatic parenchyma. Some of these—it is affirmed, (*Andral*)—have been found entirely composed of cholesterine.

In this, as in other diseases of the liver, it is reasonable to expect that the bile should be a good deal altered in its properties. It is frequently of a dirty brown colour, and contains an infinite number of carbonaceous granules. The addition to it of most of the acids gives occasion to the exhalation of an intolerable odour. The urine, likewise, is commonly much changed; its specific gravity is less; it is neither acid nor alkaline, and holds numerous flakes of mucus in suspension. (*Addison*.)

Diagnosis.—There are no symptoms or signs, which can be regarded pathognomonic. A recent writer, (*Addison*), has, indeed, affirmed, that he has found the disease associated with a remarkable appearance of the face,—dependent not so much on the expression of countenance, as on the texture and aspect of the integuments. The appearance, according to him, is purely tegumental, and is not confined to the face, but may pervade the whole surface of the body, although he is disposed to think, that it is earliest observable, as well as most conspicuous, in the integuments of the face and backs of the hands. The skin has the appearance of being bloodless, almost semi-transparent, and waxy; and when this is associated with mere pallor, it is not very unlike polished ivory; but when combined with a more sallow tinge, as is now and then the case, it resembles more a common wax model. To the touch, the general integuments, for the most part, feel smooth, loose, and often flabby; whilst in some well-marked cases, all its natural asperities would appear to be obliterated, and it becomes so smooth and soft, as to convey a sensation resembling that experienced on handling a piece of the softest satin. Whether this condition of the integuments precedes or follows that of the liver; and whether the two are necessarily associated, in every instance, Dr. Addison is not prepared to offer a decided opinion. His observation ought to be borne in mind; although it would be singular were it a universal evidence of this lesion of the liver; and still more singular, if it were an evidence of this lesion only.

A recent writer (*Albers*) considers the most important diagnostic to be,—great emaciation without dropsy:—and he affirms, that in hypertrophy, cirrhosis, and all other chronic diseases, dropsy

always occurs in the form, both of ascites and anasarca; but the generalization is evidently too comprehensive.

Causes.—The causes of adiposis of the liver are entirely unknown. It has been believed to be owing to irritation of the organ; but this view—as has been well observed, (*Andral*)—is mere hypothesis. Nor can we say more of the opinion—that it is owing to chronic inflammation with venous engorgement. (*Professor Gross*, of Louisville.) We know that adiposis takes place—not in the liver only, but in the adipous tissue in every part of the body, yet we should hardly be justified in referring obesity, occurring either spontaneously or artificially, to chronic inflammation with venous engorgement.

The suggestion, (*Andral*), that we might, with as much propriety, assign it to the nutrition of the liver having become less active, is good. We find, indeed, that in proportion as an organ—say a muscle—is exercised, its nutrition is augmented, and that the fat, deposited in the cellular tissue between its fasciculi, and surrounding it, is diminished in quantity, so that the outline of the organ is well pronounced; but if the muscle be kept in a state of inaction, its nutrition diminishes, whilst the secretion of fat becomes augmented. *Andral*, indeed, affirms, that it is a great law of the economy, that whenever an organ tends to atrophy, a fatty matter is deposited around it, or in the place of its molecules.

It is a singular fact, that fatty degeneration of the liver is most commonly observed in consumptive individuals. Of 123 cases of consumption, observed at La Charité in Paris, 44 had the lesion in question. It is met with, however, occasionally, when the lungs are not diseased. (*Mackintosh*, *Addison*, *Andral*.) Of 49 cases, which occurred to one observer, (*Louis*), 47 were in phthisical individuals. It has been hitherto witnessed more frequently in young than in old persons; and in females oftener than in males. (*Louis*.) Of 65 cases, observed in the Royal Infirmary of Edinburgh, all but one occurred in women. (*Home*.)

Treatment.—As there are no pathognomonic signs of the disease, no precise plan of treatment can be laid down.

X. CANCER OF THE LIVER.

SYNON. Carcinoma of the liver, Encephalosis of the liver; *Fr.* Cancer du Foie, Hépatopathie cancéreuse ou Hépatosarcomie, (*Piorry*); *Ger.* Krebs der Leber.

Under this head may be considered, not only *scirrhus*,—which, according to some, is a common affection, but according to others, as rare as mortification, (*Mackintosh*),—but, also, *encephalosis*. Although, however, true *scirrhus* may be less frequent than is imagined, Dr. Mackintosh admits, that “a diseased state of the liver, corresponding to *scirrhus* in other organs, is occasionally seen, and is to be distinguished by its indurated condition, and its white bands.”

Diagnosis.—There are no pathognomonic symptoms of this lesion. The same uneasiness may be experienced as in other

chronic diseases of the liver; and, as in them, there may be no marked evidence of the existence of these malignant degenerations; or there may be jaundice, ascites, and anasarca. Where the morbid production is encephalosis, the countenance, it is affirmed, will be pallid, (*M. Hall*,) whilst if the disease be carcinoma, the countenance will be rather sallow, or straw coloured, as in other cancerous diseases. Occasionally, the liver may be felt extending below the false ribs, and having on its surface irregular prominences, which may be painful on pressure. In encephalosis, the tumours are almost always much larger than in scirrhus.

A case of encephalosis, which fell under the care of Professor Hall, of the University of Maryland, and which the author saw both before and after dissolution, strikingly exhibits the slight disturbance, that may, for a time, attend these serious transformations. The case is reported at length in the North American Archives of Medical and Surgical Science, with some comments by the editor of the Journal, (*Professor Geddings*, of Charleston.)

A seaman was admitted into the Baltimore Infirmary on account of necrosis of the metatarsal bones. Professor Hall made an incision, with the view of removing the portion of bone affected with necrosis, but finding it adherent, he desisted. The patient became very much depressed during the operation, and was seized, on the following day, with alarming irritability of stomach, and incessant vomiting and purging. There was no pain or tenderness on pressing the epigastric or hypochondriac regions, nor any symptom indicative of inflammation of the gastro-intestinal surface, unless the vomiting and purging be regarded as such. The pulse was feeble, undulating, and indistinct, and did not exceed forty-five beats in the minute. The tongue was red on the margins, and coated with a dark fur in the middle. The evacuations were dark, watery, and fetid. On the third day, universal jaundice supervened, without any marked change in the other symptoms. From this time, the emaciation and debility went on increasing for a month, at the expiration of which time he died, without experiencing any pain in the region of the biliary apparatus. On laying open the cavity of the abdomen, the liver was found to be greatly diseased. It was increased in size, hard, and exceedingly uneven on its surface, and of a dirty grayish-brown hue.

The stomach presented no marked evidences of disease. In the duodenum, there was a large indurated mass, intimately incorporated with the head of the pancreas, which was much increased in size, and exceedingly hard, and uneven on its surface. On laying open the diseased portion of the duodenum, it was found to be extensively involved in encephaloid degeneration, which formed a thick mass surrounding the whole intestines, and involving the contiguous portion of the pancreas. This mass was extensively ulcerated on the intestinal surface. The common choledoch duct was so much obstructed as to render it almost impervious; and, in consequence, the gall-bladder was enormously distended, and its neck, with the cystic duct, so much dilated as to form a continuous

tube from the gall-bladder as large as the finger. The whole excretory apparatus of the liver was equally distended. The common choledoch duct was of the size of the middle finger; and, on tracing it up towards the transverse fissure of the liver, the hepatic duct, and the two branches that form it, were found in the same condition. At the point, at which the latter emerge from the gland, they were large enough to receive the tip of the middle finger. They were distended with a greenish coloured mucous fluid, which flowed out in great abundance when the liver was sliced; and, before the real condition of the ducts was discovered, led to the supposition that it proceeded from numerous cysts in the substance of the gland. The coats of the excretory ducts were much thickened throughout their entire extent. The gall-bladder contained, in addition to the large quantity of fluid by which it was distended, a number of small dark coloured biliary calculi; and several of the same kind were lodged in the common choledoch duct, where they tended to augment the obstruction occasioned by the encephaloid tumour of the duodenum. The most interesting morbid appearance was the complete occlusion of the trunk of the vena porta, and its primary bifurcations, by encephaloid matter. The trunk of this vessel, for some distance from the liver, was completely plugged up; and on laying open its left and right branches, the same obstruction was found to exist in the former, nearly as far as the point at which it branches out into the left lobe; whilst, in the latter, it extended even farther—several of the subdivisions of the vessel, within the substance of the right lobe, being closed up by the same material. In one portion of the trunk of the vein, it seemed to be slightly attached to the inner surface of the vessel by means of an exceedingly delicate false membrane of a red colour; but no adhesion was discovered at any other point. The hepatic artery was in a healthy condition, and did not seem to be increased in size.

In this case, the encephalosis implicated the excretory ducts, more than it did the parenchyma of the liver; but it is singular, that such extensive disease could have existed with so little local uneasiness.

Causes.—Besides the cause of cancer in general, it has been affirmed, that blows on the region of the liver, intemperance in diet, the abuse of purgatives, &c., are circumstances that favour its production: in all cases, however, the cancerous diathesis must be present.

Pathological characters.—The liver may be found studded with tumours, varying in size from that of a pea to that of the fist. These are yellow, opaque, hard, and commonly, when cut into, present fibrous radii converging towards the centre of the tumours; but, at other times, forming concentric circles. (*Rostan.*) Usually, they present no trace of organization. Their texture is firm, and they cry, as it were, under the scalpel. At times, they are softened towards the centre, and contain a fluid like lees of wine,—the tissue surrounding them, both when of this nature and when encephaloid, being healthy. Commonly, the scirrhus tumours are smaller than

the encephaloid; the latter, indeed, may be as large as the fist, or of the fœtus at the full period.

The tissue, which forms the basis of the scirrhus tumour, is dense and fibrous; that of the encephaloid tumour is cellular and loose. The progress of the former is generally slow; of the latter, much more rapid.

It often happens, that these morbid appearances are not met with alone, and that the carcinomatous and tubercular degenerations exist in different stages of their progress.

Treatment.—If the symptoms be so obscure as to lead to no satisfactory diagnosis, the treatment must be unsatisfactory likewise. Should the lesion be suspected, it must be treated on the same principles as cancerous diseases of other organs.

XI. TUBERCLES OF THE LIVER.

SYNON. Tubercula hepatis; *Fr.* Tubercules du foie, Hépatopathie tuberculeuse ou Hépatostromosie; (*Piorry*;) *Ger.* Lebertuberkeln, Tuberkeln der Leber.

These are, by no means, of common occurrence. Even when they are present in the lungs, the liver is so rarely affected by them, that distinguished observers have never met with them, (*Cruveilhier*;) whilst others have only found them rarely. Of 123 cases of pulmonary consumption, there were but two that exhibited tubercles in the liver. (*Louis*.) Yet, by one writer, (*Professor Gross*, of Louisville,) they are said to be of very common occurrence. It is probable, however, that this is an accidental error, as in the next page he remarks, that, on the whole, he is induced to believe, that the lesion of the liver is rare in this country. Rostan affirms, that true tubercles of the liver are more rare than cancer of the organ.

The tuberculous matter itself undergoes no changes, except that it is occasionally coloured by the bile, and this bilious coloration in the midst of tubercular masses, has been met with in the fœtus. (*Cruveilhier*, *Husson*, *Billard*.)

They give rise to no symptoms, which can be esteemed diagnostic of their presence.

XII. CYSTS IN THE LIVER.

SYNON. *Fr.* Kystes du Foie.

Cysts, containing watery fluid, are not uncommon. They are usually confined under the peritoneal coat, and may appear either upon the convex or concave surface of the liver. It has been a matter of question how they form. Doubtless, there is some organic change, in the first instance, in the capillaries of the viscus, which gives occasion to the effusion of plastic lymph, or to some obstruction in those vessels. This becomes a source of irritation, and when we reflect upon the rapidity with which these cysts are formed, even in the case of the most acute and rapid abscesses, we can have some idea of the reason why they form so readily in the liver.

The following is one of the most remarkable cases of extensive serous cysts of the liver on record. (*Abercrombie.*)—

A man, aged 32, was affected with an immense tumour of the abdomen, which filled the greater part of it, extending from the region of the liver considerably below the umbilicus, and into the left side. At the upper part, near the ribs, on the right side, there was an evident fluctuation. This was most remarkable, when the patient was erect; in the horizontal posture, it seemed as if the fluid retired under the ribs. No fluctuation was perceived in any other part of the mass. The breathing was much oppressed and laborious, especially on any attempt to turn on the left side, when he seemed in danger of instant suffocation,—gasping, for several minutes, in the utmost agony, before he recovered his breath. He was much emaciated, and the affection was of about a year's standing. A puncture was made in the spot where the fluctuation was felt; and a clear serous fluid drawn off, to the amount of nine or ten pounds. The opening continued to discharge freely for several days. He was much relieved by the operation, but his strength continued to fail, and he died about ten days after it.

On inspection afterwards, the liver appeared very little enlarged. The tumour was found to consist of an immense sac, formed on the convex surface of the viscus, under the peritoneal coat; it was of such a size as—on the one hand—to press down the liver below the umbilicus; and, on the other, to force the diaphragm upwards as high as the second rib. The right lung was compressed into a small flaccid substance less than a kidney; the left was also much diminished in size; and the heart was as small as that of a child of five or six years of age. This immense cyst adhered firmly to the posterior half of the diaphragm; but, betwixt it and the anterior part of the diaphragm, there was a distinct cyst, containing a watery fluid. This last had been opened by the operation. The great cyst was entire, and contained 18 pounds of transparent colourless fluid. Its parietes were firm and dense, like peritoneum very much thickened. In the bottom of the cyst, were found two singular bodies, consisting of flat cakes of a soft gelatinous matter rolled up into solid cylinders; when unrolled, they were about ten inches in diameter, and about one-eighth of an inch in thickness, and had the appearance of a deposition, which had been separated from the inner surface of the cyst. The liver was not diseased in its structure, and the other viscera of the abdomen were healthy, but remarkably displaced,—the stomach being on the left side and the pylorus towards the left os ilii.

One of the singular circumstances of this case was—the uncommon firmness of the tumour, which gave occasion to the belief, that an immense mass of organic disease existed, without fluctuation, except at the part which was opened.

A similar case to the above is said to have occurred in the Infirmary of Edinburgh many years ago, under the care of the late Dr. Gregory. It was supposed to be an immense enlargement of the

liver; but the whole hardness suddenly disappeared, with a sensation to the patient as if something had burst internally. Fluctuation then became evident, although none had been perceived before. The patient died on the following day; and, on dissection, it was found, that this remarkable change had been owing to the cyst having burst into the cavity of the peritoneum. (*H. Mayo.*) Cases of an analogous nature have been recorded by other observers. (*Annesley, Hastings, Sir B. Brodie.*)

XIII. HYDATIDS IN THE LIVER.

SYNON. *Fr.* Hydatides du Foie.

There is no organ in the body in which hydatids are so frequently found, as in the liver. Generally, it is the "multiple acephalocyst," (*A. socialis seu prolifera*), which is met with. (*Ferrus, Bérard.*) At times, however, it is the "solitary acephalocyst," (*A. eremita vel sterilis*.)

Although the author has placed these collections under the head of hydatids, he is doubtful whether they ought not to have been considered under that of serous cysts, to which, he thinks, they belong. The more he examines into their nature, the more satisfied is he, that they are not animals, but ought rather to be esteemed diseased products, (*Mackintosh*;) not necessarily, however, the result of inflammation,—a view which, by the way, has been stigmatized as "sinking of itself before the simple lights of common sense, and not needing refutation." (*Rostan.*)

The most common seat of hydatids is in the right lobe; and these are often contained in the interior of a large cyst, or "maternal hydatid,"—as it has been termed. Occasionally, more than a thousand have been counted. Their size is likewise various. Sometimes, they are not larger than a millet-seed, whilst at others, they are as large as the fist. The liquid, in which they swim, is rarely limpid. It is of a yellowish hue, and its quantity is, at times, considerable. A case is on record, in which twenty quarts of fluid were discharged from a swelling of this kind. The fluid consisted of serum and a thick jelly, (*Bianchi*), which was regarded as the *detritus* of an acephalocyst.

A case is mentioned, in which a cyst was attached to the concave surface of the liver, which contained a quart of watery fluid, having a hydatid floating in it. (*Annesley.*)

Hydatids—like serous cysts in general—are found inclosed in a large cyst, which may be of considerable thickness, and composed of fibrous layers in super-position, which are often incrustated with phosphate of lime in irregular patches. Like those cysts, too, they may experience various alterations, so as to be taken for steatoma, atheroma, meliceris, and even for softened tubercles. (*Ferrus, Bérard.*) The author has occasionally met with tumours resembling scirrhus, some of which have contained bladders filled with a thin watery fluid: others have been seen containing a fatty matter, and others, again, a sandy substance. (*De Haen.*)

Diagnosis.—As these cysts become very slowly developed, they do not give rise, in the first instance, to any symptoms that indicate their presence in the liver. It is only when they become so large as to interfere with the functions of that viscus, that any suspicion can be entertained of their existence; and even then there are no symptoms of their presence distinct from those of other chronic affections of the organ. Commonly, the digestive functions are disturbed; the hypochondrium is swollen; the false ribs are raised up, and a fluctuation is, at times, perceptible.

With regard to the termination of these hydatid formations;—if they attain the biliary passages, they may pass into the duodenum, and be discharged by the bowels; or, if any adhesion occurs between the cyst and the intestines, they may be discharged in the same manner. In such case, their existence admits of detection. Again, they may be discharged into the cavity of the peritoneum, and occasion fatal peritonitis. (*Rostan.*) In a case, which occurred in the Middlesex Hospital, a cyst in the liver, containing hydatids, burst into the lungs; and, for a long period, hydatids continued to be expectorated along with a yellowish mucus. All doubts as to the real nature of the case were removed by the necroscopy. (*H. Mayo.*)

Treatment.—Where the presence of serous cysts in the liver is decidedly proved by the existence of fluctuation, it has been advised—from the success obtained by evacuating purulent collections in that organ—to adopt the course of evacuating them artificially. Cases, indeed, would seem to have occurred; (*Ferrus, Bérard,*) where their spontaneous rupture through the parietes of the abdomen has eventuated favourably. The operation has, accordingly, been practised; and five well authenticated cases of a successful result have been published. (*Récamier.*) This gentleman first introduces a capillary trocar, by way of exploration; and applies over the canula a cupping glass, which draws out the limpid fluid of the cyst, if such there be. He now applies caustic potassa, and as the eschar separates, he applies it again and again, with the view of causing inflammation in the peritoneum, and exciting adhesion between it and the peritoneal coat of the liver, or the parietes of the cyst. Gradually, the parietes of the cyst are destroyed, and in this way the fluid is evacuated. To prevent the access of air, which is regarded as a deleterious agency, in cases of a spontaneous rupture, the interior of the cyst is injected, and kept constantly filled with a liquid, which is at first emollient, and, later on, made slightly irritating and antiseptic. (*Récamier.*) The progressive diminution in the quantity of fluid required to fill the cyst is a measure of the gradual approximation of its walls.

Another method (*Bégin*) is, to make an incision, about two or three inches long, in the skin, over the most prominent part of the tumour; the muscular layers are then successively divided, until the peritoneum is exposed, which the surgeon elevates with the dissecting forceps, and cautiously opens. If the omentum or in-

testine present, they are gently pushed back, and, by the aid of a director, the incision into the peritoneum is made as large as may be esteemed advisable. The tumour presents itself at the bottom of the wound, which is now dressed, and the patient is placed on the same regimen as after serious operations. Two or three days afterwards, the dressing is removed; the peritoneum is found inflamed, and the cyst has contracted adhesions with the margins of the wound. The scalpel is now passed into it, the liquid evacuated, and a tent of lint introduced into the opening.

It need scarcely be said, that these operations require much cautious reflection, and that they must always be extremely hazardous, and liable to uncertainty in the results.

XIV. WORMS IN THE LIVER.

The liver of the human subject has been found to contain an entozoon, which, however, is more common in animals,—as the sheep, goat, ox, stag, fallow-deer, horse, ass, hog and hare. In sheep, affected with the rot, the organ is sometimes filled with them.

This entozoon is the *distoma hepaticum* or *fluke*, which has been already referred to, (vol. i, p. 194.) It is somewhat lance-shaped, with both extremities obtuse, having two orbicular openings,—one in front, which is directed obliquely inwards, and another behind and inferiorly, which is slightly prominent, and answers to the anus. The young worm, generally seen, is of a variegated brownish white colour; the adult, of a dirty yellowish, greenish or brownish hue.

These worms have been said to exist in the branches of the vena porta, as well as in the pori biliarii. It has been denied, that they are ever seen in the former, (*Rudolphi*,) but the evidence is too strong to be set aside. (*Frank*.) There can be no doubt, however, that they are more frequently met with in the biliary ducts, where their presence—especially in animals—is found to have produced much thickening of their coats. This has been ascribed, however, to induration of the mucous secretions. (*Bremser*.) In a liver, thus circumstanced, the organ is unequal in its surface, and if the projecting parts be pressed upon, a crepitation is heard, which proceeds from the bruising of small osseous laminae. These incrustations are, at times, so extensive, that, on dissection, small bony tubes can be obtained. In such case, the entozoa generally die.

Occasionally, other entozoa crawl from the small intestines into the common choledoch duct, and ascend even as far as the gall-bladder. Such is the case with the *ascarides lumbricoides*, the presence of which may excite much irritation and profuse suppuration. In a case recorded, (*Thos. Bond*, of Philadelphia,) a large abscess was found in the substance of the liver, which contained nearly two quarts of bloody matter, with a worm nearly two feet long, by an inch in diameter. It is impossible, however, to form

any accurate judgment of the species of the worm from the description.

Recently, a rare species of hydatid—the *Echinococcus hominis*—has been found in the human liver. (*Curling*.)

On examining the liver of a rat, a serous cyst was found, about the size of a marble, on the under surface of the organ, which contained a tænia one foot in length, by two lines in breadth. It was completely coiled up, and lived for upwards of an hour after its removal. (*Professor Gross*, of Louisville.)

When the presence of entozoa in the liver is suspected, the verminous diathesis must be remedied by the agents described elsewhere. (Vol. i, p. 199.)

XV. HEMORRHAGE OF THE LIVER.

SYNON. Hæmorrhagia hepatis, Apoplexia hepatica; *Fr.* Hémorrhagie du Foie, Hemorrhagie hépatique, Apoplexie hépatique, Hépatorrhagie, Hémohépatorrhagie; (*Piorry*.) *Ger.* Blutfluss der Leber, Leberblutfluss.

Hemorrhage of the liver is by no means a common occurrence. It can rarely happen, that the engorgement of vessels is such as to give rise to rupture of their coats, and consequent effusion of blood into the organ. It has been maintained, indeed, that the affection is more common than is generally thought; and that the structure of the parenchyma of the liver, and the great number of vessels predispose to it. (*Cruveilhier*.) It is a fact, however, that the lesion is rarely met with on dissection; and, in opposition to the views of Cruveilhier, the belief has been expressed, that the very "richness of the organ in vessels, as well as the softness of its parenchyma, is adapted to prevent rupture of vessels, and effusions similar to those that take place in the brain and lungs." (*Heyfelder*.)

When effusion of blood does occur, it may either form a cavity in the organ, or the parenchyma may be torn, and the fluid be effused into the cavity of the peritoneum; or it may make its way into the biliary ducts, attain the duodenum, and be evacuated by vomiting or *per anum*.

The disease cannot be diagnosticated during life; should, however, the liver exhibit sudden evidences of great augmentation of size; and deep-seated fluctuation be, at the same time, observable; and should symptoms of internal hemorrhage supervene; and, especially if, after evidences of great hyperæmia, hemorrhage should suddenly take place from the stomach and bowels, with diminution of the hepatic hyperæmia, the existence of hemorrhage of the liver may be suspected, (*Piorry*;) but unless these signs are coexistent, it is obviously impossible even to suspect the origin of the hemorrhage, as we have no means of distinguishing, whether the blood proceeds from the biliary apparatus, or from the mucous membrane of the stomach and bowels. (*Andral*.)

XVI. NEURALGIA OF THE LIVER.

SYNON. Hepatalgia; *Fr.* Névralgie du Foie; *Ger.* Leberschmerz.

The nerves of the liver—like those of other organs—are liable

to morbid conditions, independently of inflammation. Neuralgia may likewise accompany neuropathic affections seated elsewhere.

Diagnosis.—This is by no means easy. The pain may readily be confounded with that arising from the passage of a gall-stone. Where, too, distinct evidences of chronic inflammation of the liver have existed, and, under the influence of appropriate treatment, the signs of inflammation and organic derangement have subsided, but severe pain continues in the region of the liver, the nature of the pain is often mistaken; it is supposed to depend upon a continuance of the inflammatory action, when it is nothing more than a neuralgic affection,—a remnant or successor of the former disease, and to which the antiphlogistic treatment may be wholly inapplicable. (*Stokes.*)

“Under such circumstances”—says Dr. Stokes—“the patient goes from one practitioner to another, taking different medicines and submitting to repetitions of the usual modes of treatment, with but little or no benefit. Now, I have seen in several cases, this symptom yield completely to treatment calculated to remove purely neuralgic affections. In a case lately under my care of a gentleman who had been attacked with enteritis and hepatitis in India, and who had taken enormous doses of calomel “for the liver,” and of croton oil “for the bowels,” this circumstance occurred. When first I saw him, he was emaciated, the skin yellow, the urine high coloured, with thirst, costive bowels, and great tumefaction in the region of the liver. These symptoms completely subsided under treatment, but a violent pain, recurring at intervals, continued obstinate. This was rapidly removed by a course of the carbonate of iron, and the use of the belladonna plaster.”

The seat of the disease is presumed by pathologists to be the hepatic plexus, the morbid condition of which is conveyed to the great nervous centres. It occurs in the nervous, and the hysterical; and is said to be not unusual. (*Stokes.*) During the height of the exacerbations, the pain, as in other forms of neuralgia, is commonly most excruciating, but, at times, it is less severe. It may be continuous, but, more usually, it is intermittent, and there may, or may not, be sensibility on pressing the region of the liver. There is not, however, any tumefaction. It is a mistake to say, with some, (*Andral,*) that there is no sensibility on pressure in hepatalgia. The author has elsewhere remarked, that pain may exist, with great sensibility on pressure, in an organ, and yet there may be no inflammation; and, on the other hand, the circumstance of excruciating pain, with exquisite tenderness in the region of the liver, furnishes—as has been well observed—a sort of key to diagnosis; for along with it we have, in hepatalgia, the skin cool, the pulse tranquil, no fever, no permanent derangement of the bowels, and no tumefaction of the liver. (*Stokes.*) If the disease, too, has been of long standing in a person of nervous habit, and has resisted bleeding, mercury, and counter-irritation, or has been

caused by those agents, the diagnosis may be considered established. (*Stokes.*)

Treatment.—This, it need scarcely be said, is the same as in neuralgia in general. Certainly, powerful antiphlogistic measures, which would be so serviceable in acute hepatitis, can scarcely fail to do mischief here. The very subjects, in whom it is generally seen, would at once contra-indicate the employment of such measures. Some of the most deplorable cases, that have been witnessed, have occurred in those, in whom neuralgia of the liver had been mistaken for hepatic inflammation, and the patient subjected to such modes of treatment as gave the constitution a shock from which it never recovered. (*Stokes.*)

The treatment that promises most success is the use of the subcarbonate of iron in large doses, and relieving the violence of the pain, during the exacerbations, by mustard plasters, and anodynes, given both by the mouth and rectum. In the intervals, the emplastrum belladonnæ of the pharmacopœias may be worn. The following form has been advised, but it does not seem preferable to the officinal.

Take of extract of belladonna, three parts; of gum ammoniac and soap plaster, each one part. Spread these on a piece of leather with an adhesive margin, and make the patient wear it over the region of the liver.

XVII. INFLAMMATION OF THE GALL-BLADDER.

SYNON. Inflammatio vesicæ felleæ, I. Cystidis felleæ, Cystitis fellea, Cholecystitis; *Fr.* Inflammation de la Vésicule du Fiel, Cholecystite, (*Piorry,*) Cystite biliaire; *Ger.* Gallenblasenentzündung, Entzündung der Gallenblase.

This disease is not common as an idiopathic affection. It is a concomitant, however, of other diseases of the liver, especially in India, (*Twining,*) and particularly of biliary calculi.

Diagnosis.—The ordinary symptoms are said to be;—sudden, acute, and, at times, excruciating pain at the margin of the false ribs, increased by pressure, by inspiration, and the horizontal posture on the back. The patient can scarcely straighten himself, and commonly lies on the left side, with his lower limbs drawn up. The paroxysm of pain continues for some hours, when it diminishes; and commonly, as it diminishes, jaundice appears. At the same time, the digestive functions are more or less disordered, and vomiting is a usual attendant. Along with these local symptoms, are those of general fever, which, it is asserted, is accompanied by a small, contracted pulse, great thirst, but without shivering or much heat of skin. (*Andral.*) It is obvious, however, that there must be variety in the last mentioned phenomena. Constipation exists, and the urine resembles that of jaundice.

The disease may prove fatal from the intensity of the inflammation, or the gall-bladder may become perforated, and its contents pass into the cavity of the peritoneum,—a result which is announced by the supervention of sudden and fatal peritonitis, and which has

to be dreaded in all cases of inflammation of the gall-bladder. (*Andral, Cruveilhier.*)

The common choledoch duct, like the gall-bladder, may be inflamed,—*cholédocite*—(*Piorry*,) and the lesion may occur in both situations, simultaneously or consecutively. It may be suspected, when icterus supervenes on inflammation of the duodenum, along with symptoms indicating distension of the gall-bladder and hepatic disorder.

Recently, it has been affirmed, that small tumours are occasionally developed in the capsule of Glisson, which may be the cause of obstruction to the bile in its passage to the duodenum. (*Twining.*) Two small bodies—it is stated—are always to be found, on careful dissection, which appear to be absorbent glands or ganglions. One of them is situate near the termination of the gall-bladder, in the cystic duct,—the other at the upper part of the ductus communis choledochus; and the writer, last cited, affirms, that enlargement of these bodies, with inflammatory excitement about the capsule of Glisson, may cause closure of the biliary ducts. He has, at least, found the ducts obliterated exactly at the point where these enlarged glands were causing pressure.

Causes.—Inflammation of the gall-bladder may be idiopathic, or it may supervene on inflammation of the stomach and duodenum. It has been supposed, indeed, to be always secondary or symptomatic. (*Gendrin.*) It may be caused by the presence of extraneous bodies, as of worms or calculi, in the gall-bladder, and it more frequently acknowledges the last cause than any other. It may be produced, also, by blows over the right hypochondrium.

Pathological characters.—On dissection, the gall-bladder, and the ducts—if they have been inflamed likewise—will exhibit manifest signs of inflammation. It may have terminated in suppuration, in which case the quantity of matter may be very great. In one case, it contained a pint of thick purulent secretion, mixed with a great number of calculi. The cystic duct was wholly obliterated, and the parietes of the gall-bladder, which had contracted extensive adhesions to adjacent organs, were much thickened and ulcerated in places. (*James Johnson.*)

In other cases, evidences of perforation, are met with.

Morbid changes in the gall-bladder are very common amongst the residents in India. Two opposite conditions as to size are seen, which are supposed to depend upon the length of time the patient has resided in the east. 1. The gall-bladder is increased in size and distended with bile, by the pressure of which the sulcus in the right lobe of the liver, that lodges the gall-bladder, becomes enlarged and deep. This state is said to have been commonly found on the examination of the bodies of those who had recently arrived in India. 2. The gall-bladder is of less size than natural, and not in proportion to the sulcus in which it is lodged, and in many of these cases, a false membrane is found covering it, and sometimes uniting it to the adjacent parts. This morbid condition is said to be ob-

served in the bodies of those who have been long resident in India. (*Twining.*)

Frequent repletion and habitual over-excitement of the gall-bladder, and irritation of parts in its vicinity, with a disordered condition of the upper portion of the intestinal canal, are said to give rise to transient and circumscribed inflammation, which is often followed by a deposition of coagulable lymph, that covers the gall-bladder; and a similar exudation sometimes occurs in the cellular structure of the capsule of Glisson. This lymph, which in many cases unites the fundus of the gall-bladder to the adjacent portion of the colon, soon becomes organized, and, like other newly formed parts of a like nature, is subject to absorption and shrinking, so that the gall-bladder, which had been previously enlarged by frequent over-distension, becomes ultimately contracted. (*Twining.*) These are, of course, the results of chronic and repeated inflammation, between which and the acute forms all intermediate degrees are met with.

Treatment.—This must be decidedly antiphlogistic. As, however, it is not easy to distinguish inflammation of the gall-bladder from circumscribed inflammation of the liver, the treatment will usually have to be regulated by the rules laid down under the latter affection; the extent to which the antiphlogistic regimen should be carried being regulated by the degree and duration of the inflammation.

XVIII. DISTENSION OF THE GALL-BLADDER.

SYNON. Turgescientia vesiculæ felleæ, Hydrops vesicæ felleæ, Cystocèle biliosa, Ascites hepato-cysticus, Physconia biliosa, Hepatalgia Petitiana; *Fr.* Hydropisie de la Vésicule du Fiel, Distension de la Vésicule du Fiel, Cholicystiectasie, (*Piorry;*) *Ger.* Gallenblasenwassersucht.

The biliary ducts are liable to the same kind of pathological conditions as the gall-bladder; and if any obstructing cause exist in them to the discharge of the bile, great distension of the gall-bladder may be the consequence. In such case, the fluid may consist merely of bile; but, in other cases, it is a mixed secretion, and occasionally so thin and aqueous as to have given to the affection the name of *Dropsy of the gall-bladder*. This term has not, however, been restricted to accumulation of fluid in the gall-bladder, but has been applied, also, to cases in which the submucous cellular tissue of the gall-bladder has been infiltrated with serous fluid,—an affection which might be termed *Œdema of the gall-bladder*, and,—as has been remarked—belongs rather to the domain of pathological anatomy than of pathology. (*Andral.*)

Diagnosis.—When the gall-bladder undergoes distension, owing to occlusion of the cystic duct, the symptoms, at first, are not such as to direct attention to the real pathological condition. More or less pain is felt in the region of the gall-bladder, which may be constant or intermittent; and, if the former, is liable to exacerbations. It varies, likewise, in intensity, according to the suddenness or more protracted nature of the affection. When these symptoms have persisted for some time, a tumour is perceived in the right hypochondrium, beneath the margin of the false ribs, which gradu-

ally increases, at times, in the direction of the epigastrium; at others, in that of the iliac region. (*Andral, Stokes.*) This tumour may be felt to contain fluid. Where the cystic duct is alone obstructed, the condition may exist for a long time, so that the patient may be able to attend to his business without experiencing any great derangement of health. In other cases, however, the gall-bladder, or the duct or ducts above the seat of the obstruction, become perforated, and death occurs from peritonitis.

The diagnosis of these cases requires great attention. The difficulty lies in distinguishing them from abscess of the liver, as remarked under Hepatitis. Mistakes of this kind have, indeed, been made; and, under the supposition that the tumour was an hepatic abscess, an opening has been made into it, bile has been discharged instead of pus, and, by getting into the cavity of the peritoneum, it has caused fatal peritonitis. (*Mr. Todd.*)

A case has been detailed recently, (*Howship,*) in which the termination was more fortunate. A patient, who had suffered under hepatic disease in India, was admitted into St. George's Hospital, London, with a tumour beneath the cartilages of the right ribs, attended with pale stools, and a bilious tinge of the skin. Fomentations were applied. A central softness induced Mr. Heaviside to puncture it, and about two ounces of a thin purulent bilious secretion flowed daily. In three months, the discharge became scanty and purulent, and the opening contracted and healed,—the stools reassuming their healthy colour, and the patient his feelings of perfect health.

The writer last cited, (*Howship,*) has detailed the particulars of a case, in which there was reason to believe, that *permanent spasm of the gall ducts* had occasioned death. Mr. Howship took the ducts, placed them on a piece of glass in a cool place, laid them aside, and examined them six hours afterwards, when he found, that air from a common blowpipe passed through a portion of the duct, which he had at first thought to be obliterated, “and when further dissected for putting up to demonstrate the contraction, it had become as perfectly relaxed as any other part of the tube.”

Abscess of the liver—it must be borne in mind—is generally attended by symptoms of inflammation, whilst distension of the gall-bladder may not always present any corresponding train of phenomena. Such is the view of a distinguished pathologist, (*Stokes,*) but the exceptions must be numerous. He considers, therefore, the first part of the diagnosis to consist in “the occurrence of a tumour in the hypochondriac region not preceded or accompanied by any of the symptoms which characterize hepatic inflammation.” Again, in abscess of the liver, we have first induration and tumefaction, and then evidences of fluctuation, whilst, in cases of distension of the gall-bladder, the tumour is soft and fluctuating from the commencement; the patient is generally jaundiced, and there is no accompanying hectic.

In severe cases, it is affirmed, the whole of the liver may be filled

with bile, and communicate a distinct fluctuating feel, owing to the engorgement of the ducts, which are filled with bile. (*Stokes.*)

The average quantity of bile found in the gall-bladder after death has been estimated at one ounce, (*Wm. Saunders;*) but this is probably too high an estimate. One half the quantity is perhaps nearer the truth. (*W. H. Lowe.*)

Pathological characters.—On dissection, the cause that has given rise to the dilatation of the gall-bladder will be apparent. At times, it is the result of an inflammatory process; but, most commonly, it is owing to a calculus impacted in the ducts. At other times, again, scirrhus induration of the duodenum or pancreas may prevent the flow of bile into the intestine; and, under such circumstances—as in the case described under another head—(p. 43, of this volume,) the biliary ducts may be largely distended even as far as their terminal extremities. In some cases, the gall-bladder has been found enormously distended,—as large even as the urinary bladder. (*Cruveilhier.*)

The fluid contained in the reservoir is not always alike. It may be bile but little altered in its characters; or it may be watery and without any bitterness: sometimes it is like jelly, and at others, resembles albumen or synovia, and even urine. (*De Haen, Tiedemann, Louis, Andral.*)

Treatment.—It is impossible to have recourse to any plan of treatment, which can remedy the evil. It must be altogether palliative, and adapted to the removal of coexistent symptoms. Puncturing the tumour can scarcely be said to be the only resource, inasmuch as it can rarely, if ever, be proper.

The gall-bladder is liable to other morbid alterations, which are more interesting as questions of pathological anatomy than of pathology. Of these, *ossification* is one. There are many cases on record, in which the reservoir has become almost wholly converted into bone, (*Baillie, Grandchamp, Meckel;*) and others, in which the gall ducts, and especially the ductus communis choledochus, have undergone this conversion. (*Sömmering, Hufeland*) These lesions cannot be diagnosticated during life.

Occasionally, too, *atrophy* of the gall-bladder and its ducts is observed,—the cavity becoming progressively less, and the parietes converted into a small solid fibrous mass. (*Ollivier, Andral, Durant-Fardel.*) Cases, too, are on record, in which the gall-bladder has been altogether wanting,—at times, as the result of a morbid process; at others, as a congenital defect: a fact, which shows, that the reservoir is not indispensable to the execution of the digestive or other functions. There are no symptoms, which can be regarded as pathognomonic of these lesions.

Of *obliteration and obstruction of the biliary ducts* mention has already been made. The subject is also intimately connected with those of gall-stones and of jaundice, which will next engage attention.

Cancer of the gall-bladder and ductus communis choledochus is met with at times, without the liver participating; or those parts may become affected secondarily. In most of these cases, the symptoms have been—jaundice, with a tumour in the right hypochondrium, and more or less disorder of the stomach and bowels. (*Cruveilhier, Heyfelder, Durant-Fardel.*)

XIX. BILIARY CALCULI.

SYNON. Calculi fellei seu biliarii, Gall-stones; *Fr.* Calculs biliaires, Pierres au Fiel; *Ger.* Gallensteine.

The formation of gall-stones in the gall-bladder is by no means of uncommon occurrence; and, frequently, they are found on the dissection of those who have given no reason to suspect their existence. In these cases, they have formed gradually in the gall-bladder, and have remained there; but when they leave that reservoir, and pass along the ducts, the irritation excited by them in the biliary passages is so great, that its source can scarcely be mistaken. These two conditions have given rise to the distinction between the *chololithus quiescens*, and the *chololithus means*,—the “quiescent, and the passing gall-stone.” (*Good.*) To the pathological state, that gives occasion to their formation, and characterizes their presence, the names,—Chololithus, Cholelithus, Cholelithia, Cholelithiasis, Lithiasis hepatica; *Ger.* Gallensteinkrankheit, Steinerzeugungssucht in der Gallenblase—have been given.

Diagnosis.—The presence of calculi in the gall-bladder, of recent formation, may give rise to no uneasiness whatever; or pain may be felt in the epigastric region towards the right side, shooting through to the back, with more or less disorder of the stomach and first passages; and, at the same time, a yellowish hue may be perceptible. These may be all the uneasy feelings experienced even when the gall-stones may be so large, or so numerous, as to form a prominence beneath the cartilages of the ribs, so as to permit the calculi to be detected by palpation in thin subjects. (*Andral.*)

When, however, a calculus begins to move along the ducts, the symptoms are much more marked. Then commence the aggregate of phenomena, which have been termed *hepatic colic*. The patient is attacked, more or less suddenly, with excruciating pain in the epigastrium and right hypochondrium; and, along with this, with nausea and vomiting. The abdominal muscles are thrown into spasmodic contractions, the extremities are cold, the body bathed in perspiration, and the pulse generally unaffected. The sudden attack of most excruciating pain, whilst the pulse is not more excited than natural, has, indeed, been esteemed diagnostic of this affection. (*Heberden, Bricheteau, Louis, Stokes.*) The suffering is sometimes so great, that the author has seen strong individuals writhing on the floor in the utmost agony, and the same fact has been mentioned by others. (*Heberden, Stokes.*) At times, this condition is followed by jaundice, but the latter is not a universal

sequence. It has, however, been affirmed, that if the gall-stone becomes impacted in the duct, jaundice is sure to follow. (*Stokes*.)

When these symptoms have continued for a time with extreme violence, an interval of rest is sometimes experienced, which is of longer or shorter duration, and may be followed by a renewal of the suffering in all its severity. Difference of sentiment has existed as to the cause of this alternation of pain and ease. Some have presumed, that the recurrence of the suffering is owing to the passage of another calculus. The author has been disposed to regard the first paroxysm to be owing, in most cases, perhaps, to the progress of the calculus from the gall-bladder through the cystic duct, and the cessation to its discharge into the ductus communis choledochus, which is of much greater capacity; and the second paroxysm has appeared to him to be caused by the calculus reaching the extremity of the choledoch duct, which is known to be of smaller calibre than the rest of the canal. As soon as it clears this portion of the duct, it passes into the duodenum, and the relief is permanent. If the evacuations be now carefully examined, a biliary calculus may be found mixed with the discharged fæces, but the calculus is not always discoverable even when the symptoms have been marked. It has been affirmed, that the subsidence of pain is no proof of the removal of the disease unless bile is discharged by stool or vomiting, (*Stokes*;) and, as a general observation, this is true; but, at times, the evidences of bile in the evacuations are equivocal, and yet no doubt may exist as to the calculus having been discharged.

In consequence of the severe spasm, induced by the presence of the gall-stone in the ducts, signs of inflammatory action sometimes supervene,—as indicated by tenderness on pressing the right hypochondriac and the epigastric regions, and more or less febrile indisposition. These symptoms usually subside, and the individual is speedily restored to health; but, in other cases, lymph may be thrown out, and the duct be permanently closed; or ulceration of the gall-bladder, or of the ducts, may ensue, with all the fatal symptoms previously depicted. In other cases, it has been found to have made its way into the duodenum by ulcerative absorption, and to have been discharged.

Causes.—Age certainly affords a predisposition. Biliary calculi are extremely uncommon in young children. The author knows, indeed, of no case of the kind. They would seem to be more frequent after the age of forty or fifty; and to occur most commonly in persons of sedentary habits, and hence, perhaps, in women oftener than men. All observers, indeed, agree, that women are more liable to them, (*Stokes, Hoffman, Haller, Sömmering, Andral, F. Dufresne*;) and by some it is affirmed, that they are more subject to them about the critical period. (*Andral*.) It has been estimated that in England, five-sixths of the cases of gall-stones occur in the female sex; but the estimate does not appear to be founded upon any data observed numerically. The attacks are said to occur more frequently in winter than in summer, (*Andral*.)

but here, again, data are wanting, and all that we are perhaps justified in affirming is,—that the calculi appear to form less in summer than in winter. (*Thénard.*)

Pathological characters.—The number of calculi met with on dissection is at times considerable. It rarely, indeed, happens, that they are solitary. Their number varies from a few to some thousands. As many as 3646 have been counted. (*Morgagni.*) When they are so numerous, they are usually very minute: on the other hand, they have been seen as large as a hen's egg, and even larger.

In regard to chemical composition, biliary calculi are of different kinds. The most recent analysis of healthy bile, (*Muratori,*) assigns it for constituents—peculiar fatty matter; colouring matter; cholesterine combined with soda; picromel; extract of flesh; mucus; soda; phosphate of soda; phosphate of lime, and chloride of sodium. Now, certain of the biliary calculi are formed of almost pure cholesterine; others of inspissated bile, or at least of its resinous matter, with the nature of which chemists are not yet well acquainted; and others—and the greatest number—consist of cholesterine and thickened bile in various proportions. All, moreover, contain concrete mucus or albumen, phosphate and carbonate of lime, and traces of oxide of iron.

Occasionally, the proportion of calcareous salts is very large, so that the calculus seems to be formed of them entirely with a tinge of bile. (*Marat.*)

Calculi of pure cholesterine are white, transparent, and of a crystalline, radiated or laminated structure; they are of a yellowish, greenish or green colour, and they may still preserve their semi-diaphanous character, and the same texture, when a small quantity of the colouring matter of the bile is combined with them. Their shape is commonly ovoid, and their size that of a pigeon's or sparrow's egg. More than one rarely exists in the gall-bladder. They are insoluble in water, in which they swim, but are soluble in hot alcohol, from which they are precipitated, on cooling, in brilliant plates; soluble also in oil of turpentine, and the caustic alkalies. Exposed to a high temperature, they soften, melt and are volatilized without decomposition. They are the *cholesteric* calculi of some writers. (*T. Thomson.*)

The biliary calculi, that are formed wholly of inspissated bile, or of the resinous colouring matter of the bile—termed the *inspissated* (*T. Thomson*)—are not common in man, but are the most so in animals, especially the ox. (*Videcoq.*) Their colour is brown and blackish, their size not considerable, varying from that of a pea to that of a hazel-nut; their surface granular and studded with hard irregularities; their consistence considerable, and specific gravity greater than that of water. They have no regular arrangement; but, in the centre, is sometimes found a cavity filled with a blackish, shining mass; very distinct from the rest of the concretion. They have a bitter taste, and are affected by reagents like inspissated

sated bile. When this same matter, mixed with a very slight portion of cholesterine, exists at the surface of other concretions, it forms a brownish layer of greater or less thickness, constituting, at times, a kind of rind of an ebony colour.

The most common calculus is, doubtless, that which is composed of a mixture in various proportions—or of alternations—of cholesterine and the colouring resinous matter,—forming the *mellitic* calculus of some. (*T. Thomson.*) These calculi are rarely solitary. They are frequently seen crowded together in the gall-bladder to the number of 15, 20 and upwards: at times—as already remarked—there have been some thousands. When only one exists, it may be very large;—as large as a hen's egg, and even larger: when they are in great numbers, they are usually small, not larger often than a grain of sand. They are soft, smooth, and almost always of polygonal shape,—all, indeed, that the author has seen, have been so; the larger have, however, been observed of an oval or round shape. (*Videcoq.*) Their colour is determined by the proportion of the two substances that enter into their composition. Usually, they are of a honey-like hue, whence the epithet *mellitic*. Some of them are blackish, brown, yellow, or greenish at the exterior; yellow, of different shades, or greenish internally; others, again, are marbled, or form mixtures of green, yellow and white. They bruise and break readily, and may be reduced to a powder, which is greasy to the touch.

The examination of a great number of biliary calculi has led to the belief, (*Loir,*) that the yellow colouring matter of the bile constitutes the nucleus of the greater part of them.

Biliary calculi are found in various parts of the excretory apparatus of the bile—in the hepatic ducts of the interior of the liver, in the cystic, hepatic, or common choledoch duct; in the intestinal canal, or in the cavity of the peritoneum or elsewhere, owing to the perforation of the parietes of the canal whence they may have escaped.

As to the causes that give rise to their deposition from the bile, we are much in the dark. It has been imagined, that there may be an excess of cholesterine in the blood; that inflammation of the biliary apparatus may favour the deposition of cholesterine, and that such deposition may be further favoured by lesions of the gall-bladder, which give rise to the formation of small diverticula in which the concretions are formed. These, and various other hypotheses, have been hazarded, but light is still wanted; and farther observations are necessary on this interesting topic of pathology.

Treatment.—The indications of treatment in the chololithus means (*Good*) are sufficiently evident. The pain is occasioned by the violent spasm of the ducts around the calculus, and the mode of relief is for the calculus to pass onwards into the intestine: at the same time, there is danger of the supervention of inflammation of the ducts. The indications will, therefore be:—*First*, To allay

the spasm, which prevents the progress of the concretion; *Secondly*, To employ remedies, that may solicit its onward course; and *Thirdly*, to have recourse to agents, that may prevent or remove inflammation. It has been already remarked, that a diagnostic symptom of gall-stone is—the pulse being unaffected whilst the patient is writhing in agony. Blood-letting can, therefore, only be suggested as a means of resolving spasm, and of preventing inflammatory action. The author has always succeeded in such cases, without the necessity having arisen to make use of the lancet; but, at the same time, if the patient be plethoric, no hesitation should exist in having recourse to it. It is an excellent antispasmodic; and if pushed to the induction of full relaxation, as indicated by incipient or complete syncope, it may resolve the spasm, and facilitate the progress of the calculus. Blood-letting, too, is a good preparative to the use of the most important antispasmodic—opium. If blood-letting be premised, it should be followed up by full doses of the anodyne;—commencing with not less than two and a half, or three grains of opium in the form of soft pill, or of the equivalent of the tincture, the black drop, or the preparations of morphia. In this as in other spasmodic diseases, it is astonishing how much opium may be administered without inducing narcosis. The author has sat by the bedside of a delicate female labouring under this affection, to whom he has administered the tinctura opii every few minutes by the teaspoonful, until, in the course of an hour, she has taken one ounce by measure, and without the super-vention of narcosis, or of any evidence, at the time or afterwards—except the relief of the pain—that an opiate had been administered.

It has been remarked, (*Wm. Thomson*,) that a starch and laudanum glyster¹ will frequently produce immediate relief.

¹ R.—Mucilag. amyli, ℥iv.

Tinct. opii, ℥. 40.—M.

To be repeated every six hours, if necessary.

Where objections exist to the use of opium by the mouth, the author is constantly in the habit of adopting this course; and with entire impunity. The object in the administration of anodynes, should be the alleviation of the pain, care being taken not to induce narcosis—which, as already remarked, does not easily supervene in such cases. A recent writer, (*Gerhard*, of Philadelphia,)—it may be proper to add—in commenting upon the recommendation of Dr. W. Thomson, has the following remarks:—"Against this advice, we must protest most decidedly. No physician is authorized to prescribe so large a dose of laudanum as an enema, knowing, as he must, that sudden death will occasionally result. It is true, that, in the large majority of cases, forty minims of laudanum may be given with impunity; but it is equally true, that the dose is occasionally a fatal one. We do not believe, that more than forty drops of laudanum should ever be given as an injection, unless in the rare cases in which the suffering of the patient may compromise life." These views are the honest convictions of

their author, but his apprehensions can scarcely be considered to rest on any sufficient foundation. The author is not aware of a single case of biliary calculus, in which death—or even slight narcosis—has resulted from an enema of forty minims of laudanum.

After the spasm has been in some degree moderated, by the use of bleeding or opium, or both combined, a cathartic enema—especially of turpentine, which is, in addition, an excellent revellent—may be properly administered. The increased peristaltic action, in this manner induced, cannot fail to be felt by the biliary ducts now in a state of relaxation, and the calculus may thus be solicited in the direction of the bowel. The sequence of remedies, advised on respectable authority, (*Stokes*,) does not appear as satisfactory as the one just laid down. Dr. Stokes advises to bleed first, then leech, next employ purgatives; and, when the bowels are emptied, to have recourse to opiates. As to leeches, their application is difficult; they interfere, likewise, with the use of other agents, and, withal, they are by no means as effective anti-spasmodics as bleeding from the general system.

To aid the bleeding and narcotics in allaying the spasm, the warm bath has been found serviceable. The patient should be kept in it for a considerable time, and, whilst he is immersed, the opiates may be administered. Hot applications to the side have also afforded relief.

On the other hand, pounded ice applied to the epigastrium has succeeded immediately, in many instances, in allaying the pain, and in retarding its return, when it has not succeeded in dispelling it entirely. (*Bricheteau*.)

Much difference of sentiment exists as to the employment of emetics to fulfil the second indication; or, in other words, to solicit the onward progress of the calculus. In simple cases, where there is no accompanying inflammation, organic disease of the liver or distension of the gall-bladder, they would appear to be appropriate remedies,—the only inconvenience, likely to attend their employment, being the painful succussion of the parts affected, which they must necessarily occasion. The indirect emetics, whose action is preceded by nausea,—as the tartarized antimony,¹ or ipecacuanha,² or both combined,³ are the most appropriate.

¹ R.—Antim. et potass. tart. gr. iv. ² R.—Pulv. ipecac. gr. xv. ad xxx.
Aquaë, ℥iv.—M.

Dose.—A fourth part, every 15 minutes, until vomiting is induced. ³ R.—Antim. et potass. tart. gr. ij.
Pulv. ipecac. gr. x. ad xx.—M.

The precursory nausea relaxes the spasm of the ducts, and the subsequent efforts at vomiting exert a degree of succussion and of traction on the biliary passages, which aids the dislodgement of the calculus from its position, and its discharge into the duodenum.

With the same view, a brisk cathartic, and especially one which, like calomel, exerts its action on the upper part of the intestinal canal, may be administered alone or combined with the turpentine enema, as advised above.

R.—Hydrarg. chlorid. mit. gr. v.
 Pulv. jalap. gr. xij.
 — zingib. gr. iv.—M.

To meet the third indication,—which consists in preventing or removing inflammation,—the employment of general or local blood-letting, by means of leeches, may be demanded. In almost all cases a certain amount of febrile irritation supervenes, with more or less tenderness on pressing the right hypochondriac and epigastric regions, but it commonly passes off without any treatment whatever.

As to the various means that have been proposed for dissolving the calculi, it is not necessary to say more, than that they obviously cannot come into direct contact with them. For a long time, the *Remède de Durande*, which consists of three parts of sulphuric ether to two parts of essence of turpentine, enjoyed a high reputation. It was given every morning, in the dose of from two scruples to a drachm, and Durande recommended that it should be continued until the patient had taken a pound of it; after which the treatment was to be finished by purgatives. It frequently, however, induced excessive irritation, and, at the present day, but few employ it. (*Videcoq, Trousseau, Pidoux.*) As a solvent, it could have exerted no agency.

After the calculus has passed into the intestines, it may be well for the patient to make use of saline cathartics for some time, to keep up a gentle action upon the bowels. If his circumstances and the season will admit of it, the change procured by a visit to any of the saline or sulphureo-saline waters, with the effect of the waters themselves, cannot fail to be advantageous. Should this be impracticable, a Seidlitz powder may be taken twice or thrice a week, or an appropriate saline solution may be a succedaneum to the saline mineral waters drunk at their source.

R.—Magnes. sulphat. ʒj.
 Potassæ bitartrat. ʒj.
 Ferri sulphat. gr. x.
 Aquæ bullientis, Oij.—M.
 Dose, a wineglassful, every morning.

XX. JAUNDICE.

SYNON. Icterus, I. flavus, I. vera, Aurigo, Morbus regius, Arcuatus morbus, Morbus auriginosus, Ileus icterodes, Cachexia icterica, Choli hæmia, Icteritia flava, Fellis superfusio, Yellow Jaundice; *Fr.* Ictère, Jaunisse, Bile répandue; *Ger.* Gelbsucht, Königskrankheit.

The most prominent evidences of jaundice—as the French word *jaunisse* imports—are “yellowness” of the skin and conjunctiva. It can very rarely be esteemed an idiopathic affection. It is generally, indeed, symptomatic of many of the diseases of the biliary apparatus, already described.

a. Jaundice of the Adult.

Diagnosis.—Usually, before an attack of jaundice, the gastrointestinal functions are more or less disordered. The patient complains of loss of appetite and dyspepsia, with vertigo, nausea, and

perhaps vomiting, flatulence and tension in the epigastric and hypochondriac regions, with furred and yellow tongue. Usually, too, there is more or less lassitude and dejection of spirits. After these symptoms have continued for a longer or shorter period, the eyes are observed to be yellow, as well as the skin: the urine may be hot, is very high coloured, sometimes of a green hue, turbid, and tinging the linen; and the alvine evacuations are clay coloured;—although this last symptom may not be very evident. Commonly, the bowels are confined; and, often, there is morbid sensibility when pressure is made over the region of the gall-bladder and capsule of Glisson; but in the absence of pressure, the uneasiness is generally referred to the epigastrium. This tenderness on pressure is considered to be owing to inflammation of the upper part of the digestive tube, which has been esteemed an extremely frequent cause of jaundice, and is, generally speaking, independent of any mechanical obstruction of the gall-bladder or biliary ducts. (*Broussais*.) Taking all the cases into account, this form of jaundice has been regarded as the most frequent. (*Stokes*.)

In the mildest forms, the pulse is but little affected, but where it is owing to, or connected with, inflammation of the liver, or of the lining membrane of the stomach and bowels, the circulation is quickened. In very bad cases, the brain is more or less affected, and, as has been properly remarked, the supervention of symptoms denoting an affection of the nervous system, must be looked upon with alarm in any form of the disease. (*Stokes*.) A most alarming complication is coma. Robust patients have been known to die with symptoms of oppressed brain, within thirty-six hours after the sudden appearance of intense jaundice. (*Twining*.) Many cases have been detailed, which were complicated with this formidable symptom, the majority of which resisted all the ordinary resources of art, (*Marsh, Griffin*;) and Dr. Stokes affirms, that he has never seen a case, in which the coma was distinctly established, terminate favourably. The experience of the author has been more fortunate; but still, the complication must, in all cases, be looked upon as alarming, and more so even in hot, than in temperate climes.

It is proper to remark, that the colour of the skin is not always the same; it may vary from a citron almost to a black, whence the name “black jaundice,” applied to it in some cases. Usually, too, before the coloration appears, there is a disagreeable itching or tingling of the whole surface, which may continue for some days; as long, indeed, as the morbid condition of the blood.

The attacks of jaundice sometimes come on insidiously; at others, especially when the disease originates from a moral cause, it may appear almost instantaneously. A case is related of a man, who sat down to dinner in tolerably good health, but was soon compelled to retire, owing to his feeling indisposed, his whole surface being suddenly tinged. The first circumstance, that excited attention to him, was a remark which fell from himself, that the tablecloth was

of a greenish colour. (*Mackintosh.*) It is said that Murat, on learning that his queen had assumed the sovereign power at Naples, in his absence, fell into a violent rage, and was almost instantaneously jaundiced. (*Stokes.*)

In referring to the case cited above, Dr. Mackintosh states, that he has known several individuals affected with jaundice, who saw every object coloured. It is strange, that this *chromatism*, as it may be termed, should exist in a very few cases only. Most of the secretions are unquestionably tinged yellow, but not all. The colouring matter of the bile is rarely found in mucus or milk, for example. The yellowness of the conjunctiva is, however, one of the pathognomonic symptoms. Bile is also necessarily present in the blood-vessels of the retina; yet yellow vision is not often seen. In the experience of one observer, (*P. Frank,*) it was observed but five times in about a thousand cases. (*W. Horn.*) The cause of the phenomenon, when it does present itself, has been a question. (*Graves, Elliotson.*) It has been supposed to be owing to inflammation of the cornea, the vessels of which become dilated, and receive yellow blood, (*Elliotson;*) but strict observation has not always exhibited such a pathological state. The most probable supposition seems to be,—that the humours themselves are tinged yellow; and it has been suggested, that where vision is not yellow, they may have escaped the tinge. As, however, the phenomenon is observed in very few cases only, the coloration of the humours must be an uncommon occurrence, provided the fact and the explanation be true,—yellow vision, in other words, must be an exception to the general rule in this disease. Lastly, the phenomenon has been ascribed to direct nervous influence, on the ground, that patients, in other diseases, as in typhus fever, without being in the slightest degree jaundiced, have seen everything yellow. (*Stokes.*) It is possible, that all these conditions may be, occasionally, concerned in the causation.

Commonly, the disease is tedious; its duration varying from a week to three, four, five, or even longer. As a general rule, too, when uncomplicated, it terminates in health, but where the liver is diseased, or the encephalic complications, before described, supervene, the result may be fatal. Occasionally, the indisposition is so trifling, that the patient attends to his business as usual; and a writer, already cited, (*Stokes,*) states, that he has seen persons who laboured under this affection for more than a year, and yet who had, during the whole of that time, the digestion good, the bowels regular, the flow of urine natural, and the circulatory, nervous, and respiratory systems apparently conformable to the healthy standard.

Causes.—These are very numerous; inasmuch as jaundice may be the result of every organic lesion, which acts directly or indirectly on the liver and the biliary ducts. Allusion has already been made to moral emotions as a cause. Of 19 cases, observed with great care in reference to causation, symptoms of gastro-enteritis existed at the outset in eight cases; and, in one, a violent blow had

been received on the head, three months previously; in two cases blows had been inflicted on the abdomen on the right side, a short time before the invasion of the jaundice; and in almost all cases the liver was large. There were six cases, in which the first symptoms were referable to hepatitis; one in which there was disordered menstruation, and two others in which the patients did not assign any appreciable cause for the disease. In two instances, constipation had preceded. (*Piorry.*) M. Piorry considers, from all his observations, that along with the moral, there is always a physical, cause. (*Andral, Cruveilhier.*)

Obstruction of the ducts from any cause,—as from hepatic tumours, gall-stones, or enlargement of the absorbent ganglia in the vicinity of the ducts,—are evident causes, by obstructing the course of the bile, and occasioning its absorption into the blood vessels; and mention has already been made of inflammation of the upper part of the alimentary canal as an extremely frequent cause of jaundice. This is, generally speaking, independent of any mechanical obstruction of the gall-bladder or biliary ducts, and probably gives occasion to a diminution or arrest of the biliary secretion. It is a variety of jaundice from non-elimination. (*W. H. Lowe.*)

Where the jaundice arises from hepatitis, the inflammation is said to have been most commonly situate on the concave surface of the liver. (*Abercrombie.*) At one time, it was the common belief, that when jaundice appears suddenly and without any premonitory symptoms, it is owing to spasm, or to the opposite condition—paralysis of the gall-ducts; but the belief does not appear to rest on any pathological observations. (*W. H. Lowe.*)

Pathological characters.—The general opinion of pathologists is, that jaundice is owing to the presence of the bile, or of its elements, in the blood. Chemistry has not, however, positively established this. Deyeux, John, and Lassaigne, did not find, that the yellow principle of the serum of the blood, in a case of chronic jaundice, had either the taste or the smell of the bile, and they inferred that the bile was not mixed with the blood. On the other hand, Clarion found in the serum a green matter similar to that of the bile, and Orfila found, in the urine, the colouring matter of the bile. If to the serum of jaundiced blood, diluted sulphuric acid be added, it will be found to change its yellow straw colour for the characteristic green of the bile. (*B. Babington.*)

Of the existence of a yellow colouring matter in the blood of the jaundiced, there can be no doubt, whatever there may be in regard to its nature. It would seem, however, that some of the most distinguished observers are of opinion, that it is analogous to that of the bile. (*Piorry, Chevreul, F. Boudet, Collard de Martigny, Lecanu, Gibert.*)

The fact of bile being in the blood is likewise confirmed by the circumstance already stated, that in cases of jaundice, where an opportunity has occurred for *post mortem* examination, more or less obstruction has commonly existed to the course of the bile. It

was found, also, experimentally, that icterus could be induced on animals, at will, by tying the branches of the hepatic duct. All the portions of the liver, that corresponded to the branches of the obliterated trunk, were filled with bile, and jaundice supervened. Still, a question may arise in these cases, whether the bile is absorbed and passes into the mass of blood; or whether, owing to the obstruction of the duct, bile is no longer separated from the blood, but remains in it; as urea is found in the blood after the kidneys have been extirpated. The latter opinion has been embraced by some; and a recent pathological writer, (*H. Mayo*), adopts the view, that ordinary cases of jaundice depend upon suppression of bile, and that the bile, abnormally accumulated in the blood, finds vent in the secretions of other parts, which thence become coloured yellow. In confirmation of this opinion, he states, that bile is detected in the blood of jaundiced persons, whilst the liver, in those who have died of the disease, is generally pale, and without bile.

In the difficulties of the subject, it has been supposed by some, that jaundice consists in an altered condition of the blood independently of the bile; but if such exist it cannot well be an altered condition of the colouring matter of the blood, inasmuch as the red particles are apparently unchanged; and, moreover, the adventitious colouring matter is present where there are no red globules, as in the serum, and in different secretions obtained from the blood. Under every view, the rapid—almost instantaneous—development of jaundice, under certain moral affections, is sufficiently difficult of explanation. It is not unique, however; for we have examples of other singular changes in the body under similar circumstances,—as of the hair changing colour in a short space of time under terror, &c. &c.

On the whole, we are justified, perhaps, in the conclusion, that jaundice is most commonly the result of the absorption of the yellow colouring principle of the bile from the biliary passages, but that it may possibly be owing, in some cases, to arrest of the biliary secretion, and the retention of the bile or its elements in the blood. (*Piorry*.)

Treatment.—The therapeutical management of jaundice must obviously vary according to the accompanying pathological condition. If the disease has come on spontaneously, and the most accurate investigation cannot detect any of the morbid states previously pointed out; if there be no epigastric pain, and no evidence of accompanying gastro-duodenitis; if—in other words—there is only evidence of the bile having passed into the blood, and time alone is required to correct the *error loci*—no particular treatment is demanded. Rest, laxatives, moderate diet, and the use of diluents—as lemonade, may be all that is demanded. If, however, fever exists with manifest signs of inflammatory action of the lining membrane of the stomach and bowels, or of the liver, a more vigorous treatment is necessary. Leeches may be applied over

the affected region;—the French advise them also to the anus:—ice water may be allowed, and the whole of the antiphlogistic treatment be inculcated; using the warm bath; keeping the bowels open by any gentle laxative—as Epsom salts, with or without senna, or castor oil—or by enemata; and carefully avoiding every form of mental or corporeal excitement. In India, where this—as well as every other hepatic affection is extremely frequent, the most successful plan of cure is the antiphlogistic;—depletion by general blood-letting and leeches; active purgatives, tepid baths; low diet, and quiescence in the beginning of the disease, followed by mild cathartics, and a small blister over the region of the gall-bladder. (*Twining.*)

The routinist, under the idea, that mercury is capable of modifying all disorders of the biliary system, whatever may be their nature, is in the habit of prescribing this agent in jaundice. In a simple case of jaundice, it is difficult to see what can be its beneficial operation. The notion, under which it is usually prescribed, is, that it augments the biliary secretion; but if the pathology of jaundice consists, as many maintain, in the absorption of bile from the biliary ducts, any agent that will increase the secretion of bile cannot fail to act injuriously, and to augment the evil. Mercury, with a view of exciting biliary secretion, in such cases—it has been judiciously remarked, (*Twining,*)—would be as unreasonable as the administration of diuretics to a man with a distended bladder, and whose perspiration had a urinous odour, showing that urine was freely secreted and absorbed into the system, when we knew, at the same time, that he had an impervious stricture of the urethra. It is only, indeed, in cases, where there is reason to believe in the existence of chronic hepatic disease, that we can expect advantage from mercurials, and then not from any agency which they exert on the biliary secretion especially. Under the new action, which they induce in the secretory system in general, they may act beneficially on the hepatic disease; and, by removing it, remove likewise one of its consequences—the jaundice.

When coma supervenes in jaundice, the case should be treated as one of hyperæmia of the encephalon; the head should be shaved; leeches or cups be applied behind the ears, or to the nape of the neck; blisters be directed to the same region, with revellent glysters (turpentine) and sinapisms to the feet;—the treatment, in short, elsewhere recommended in hyperæmia of the encephalon. In such cases, where the patient dies, and the head is examined, no lesion may be perceptible in the brain or its membranes.

b. *Jaundice of the Infant.*

SYNON. Icterus infantum, I. neonatorum, Auriga neophytorum, Pædiicterus, Yellow Gum, Yellow Gown; *Fr.* Ictère des nouveau-nés; *Ger.* Gelbsucht der Neugeborenen.

This is a common affection in infants everywhere. It comes on soon after birth, without any known cause; continues for some days, and gradually disappears;—the only other symptom, gene-

rally observed, being perhaps unusual drowsiness. It has been presumed to depend upon some irritation of the intestinal canal, which seems to result from the circumstance of the digestive system being called into active exertion for the first time, and receiving a new stimulus from the mother's milk. (*Stokes, Schäfer.*) It is more probably owing to the common choledoch duct being obstructed by inspissated mucus, or by the meconium, which has collected in the intestines during utero-gestation. (*Rosenstein, Bazumes, Cheyne.*) By some, (*Powell, Burn,*) it has been referred to too viscid a state of the bile; and by others to a congested state of the liver, (*Breschet;*) and it would certainly appear, that the organ is frequently congested in new-born infants. (*Bouillaud, Andral, Billard.*) It is an affection of no consequence. Even in torrid climes, recovery is so general, that opportunities have not occurred for discovering the precise pathological condition. (*Twining.*)

The affection rarely exists at birth. It is commonly observed from the third to the seventh day; seldom in the second or third week, and terminates in health in the course of a week or two.

The disease would probably yield without any treatment whatever; but inasmuch as the cause would appear to be in many instances, at least, obstruction of the duct, it may be well to facilitate its removal by gentle laxatives;—as the syrupus rhei, (a teaspoonful,) magnesia, (gr. iv.—vj.) or castor oil.

R.—Ol. ricin.

Syrup. āā ʒss.—M.

Dose.—A teaspoonful, occasionally.

XXI. MORBID SECRETION FROM THE LIVER.

The modified condition of the fluid secreted from the liver was, at one time, regarded as the cause of almost all disorders of the digestive apparatus, and even of organs remotely connected with it; and the evacuations were regularly inspected, with the view of determining, whether the bile was secreted in too great or in too little quantity, or was of improper quality. Were we acquainted with the characters of the bile physiologically, when mixed with the different secretions from the alimentary canal, and the various ingesta,—as well as with the exact quantity, that ought to be secreted in plenary health, we should have a point of departure, whence we might deduce the pathological manifestations. It is clear, however, that these data must generally fail us. The consideration of the different diseases of the stomach and bowels, and of the liver and pancreas has shown, that numerous agencies must interfere with the biliary secretion independently of the condition of the liver itself; and that we should infer most erroneously were we always to ascribe the varying characters of the fæcal evacuations to a morbid condition of the bile.

The biliary secretion may be in too great quantity, or too sparing; or it may be perverted; and each of these conditions is worthy of a brief notice.

a. *Augmentation of the Biliary Secretion.*

SYNON. Bilious plethora, Bilious hyperæmia, Polycholia.

Bile is certainly, at times, secreted in larger quantity than usual: but it is not easy to say on what this pathological state is dependent. The liver—like other organs—may increase its secretion under some source of secretory irritation; or, irritation existing elsewhere—as in the stomach or upper part of the intestinal canal—may be propagated to the liver, which becomes affected secondarily. This is probably the mode in which *Polycholia*—as it has been termed—is generally induced; and hence, where evidence exists of redundancy of bile, the pathologist properly looks to the condition of the lining membrane of the alimentary canal. It has been elsewhere stated, (*General Therapeutics*, p. 208,) that when an emetic is administered which gives occasion to much retching, bile is almost sure to be freely evacuated; but that this circumstance is no evidence, that the secretion, prior to the administration of the emetic, was superabundant. It is only an evidence, that an emetic has been taken, the irritation, produced by which, is propagated to the liver, and induces a more copious secretion from that viscus. In like manner, under the repeated administration of cathartics, especially of such as act upon the upper part of the digestive tube, the alvine evacuations may exhibit, that the secretion of the liver is largely augmented. Yet the augmented secretion may have been wholly owing to the action of the cathartic. In neither of the above cases, therefore, should we be justified in considering the individual “bilious.”

This result was common in the system adopted by Abernethy, and which still prevails with certain therapeutists, of appealing to the liver in all cases in which the stomach is disordered; by requiring, as it has been quaintly expressed, “a blue pill at night and a pot of fæces in the morning.” The lining membrane of the stomach and bowels—already irritated or inflamed in many of these cases—was often still more morbidly implicated; and, as an almost necessary consequence, the irritation was communicated by continuous sympathy to the liver, so as, in some cases, where the inflammation was considerable—to diminish or arrest, and in others to augment, the secretion of bile.

Granting, however, that an augmentation may, and does, take place, at times, in the biliary secretion,—it may be properly asked, whether this circumstance would necessarily give rise to any morbid phenomena. The author is disposed to give a negative opinion, and where bilious diarrhœa occurs, which has been esteemed the principal symptom of bilious plethora, it may be rather owing to healthy bile passing over the irritated surface of the intestines, which has caused the increased secretion from the liver, than to the action of too great a quantity of bile on a healthy surface. A case, analogous to this, is met with daily in the urinary organs. If the secretion from the kidney be greatly augmented, we do not

necessarily observe symptoms of irritation or inflammation of the membrane over which the urine passes; but if the membrane be inflamed as in blennorrhœa, then the healthy urine gives rise to great irritation.

Along with diarrhœa of a bilious character, augmentation of the biliary secretion is said to be indicated by languor, indisposition, want of appetite, intense headache, with continued, remittent, or intermittent fever,—symptoms which equally denote the existence of gastro-duodenitis, or an approach thereto.

Treatment.—In regard to the management of such cases, difficulty exists. If the cause be any form of gastro-enteritis, it must be combated upon general principles; but for the pathological reasons before given, emetics and cathartics cannot be indicated. Perhaps, in such cases, one of the best remedies would be—the general action on the secretory organs, which mercury, administered so as not to affect the bowels, but to gently touch the mouth, is capable of inducing.

b. *Diminution of the Biliary Secretion.*

This is a condition, on which, as has been remarked, “much was said about twenty years ago, and of which much is still said in England.” (*Andral.*) He might have added in this country also. As a general rule, it is considered to be evidenced by want of colour, infrequency, and smallness of the evacuations, disordered digestion, and the various symptoms of dyspepsia. It may be caused by hepatitis, directly or indirectly induced; and, in severe cases of inflammation of the duodenum, the secretion may, for a time, be arrested; but if the inflammation continues, without hepatitis supervening, the secretion from the liver may be subsequently augmented and perverted.

Treatment.—In a chronic case of this kind, purgatives, that act upon the upper portion of the tube, are clearly indicated, and if mercurials be administered, it must be with the view of producing their local action upon the duodenum, and thence upon the liver,—not to diffuse their action over the secretory system in general, as in augmentation of the biliary secretion. In such cases, the pilula hydrargyri, or the hydrargyri chloridum mite, with saline cathartics, given so as to affect the bowels, will be advantageous.

R.—Pil. hydrargyri, gr. v.:—vel
Hydrargyri submur. gr. ij.—iij.
formâ pilulæ.

To be taken at bed-time.

R.—Magnes. sulphat. $\overline{3}$ ss.

Potassæ bitartrat. $\overline{3}$ j.

Aq. bullient. Oj.

Dose, a wineglassful, night and morning.

They should be so administered as to act slightly and daily on the bowels; the mercurials being given once or twice a week so as not to induce their peculiar action on the system.

c. *Perversion of the Biliary Secretion.*

The bile undergoes various changes in disease. Its colour is altered, its quantity modified, and its physical and chemical proper-

ties present the greatest diversity of character. Cases of such alterations of this fluid are numerous. It is recorded to have been found black, grayish, or colourless; thick, viscid, pitchy, concrete, thin and transparent, acrid, acid, &c. &c. Yet the evidences of these changes are not great in the living body; and it is difficult to say—when either the discharges from the stomach or bowels exhibit an unusual character, that might be referred to the bile—whether they are really dependent upon the morbid condition of that fluid, or upon some pathological secretion from the lining membrane of the stomach or bowels. This difficulty is signally exemplified by the fact, of every day occurrence, of green evacuations in infancy, which were at one time referred to morbid bile; but which a better pathology instructs us are owing to predominance of acidity—the admixture of acids with healthy bile producing a green colour. (*Powell, Wm. Thomson, W. H. Lowe.*)

Treatment.—In almost all—probably in all—cases, the liver is diseased directly or indirectly, and it is important for the pathological inquirer and therapist to investigate the nature of the primary affection. Generally, this is not an easy matter; and, accordingly, it is difficult to lay down any precise plan of treatment. Where the case admits of it, it may be advisable to endeavour to effect a total change in the secretory system, which can be best done by the administration of mercurials, pushed so as to slightly affect the mouth. It must, also, be borne in mind, that by the constant repetition of powerful cathartics, we can morbidly modify the secretion from both the liver and the follicles of the intestines,—a fact, which should be held in special remembrance where the practitioner is disposed—as was more the case formerly than now—to lay down the indication, that cathartics must be persevered in so long as the alvine evacuations present an unhealthy character.

CHAPTER IV.

DISEASES OF THE URINARY APPARATUS.

THE diseases of the urinary apparatus are more frequent than those of the glandular organs that have been considered. They are likewise—as a general rule—more readily diagnosticated. As the kidneys, however, are double, when one is diseased, the other may, in a great measure, supply its place, so that very extensive changes may occur in one of them, without any decisive disorder in the urinary secretion. (*Rostan.*)

The pathologist must bear in mind the position of the kidneys, which are the organs that secrete the urine,—that they lie on each side of the spine in the lumbar region; and that their average length

is about five inches, their breadth about three inches, and their thickness about an inch and a third;—their united weight amounting to about six or eight ounces. They may differ, however, greatly in size, without our being able to consider their condition one of disease. Their colour is brownish, and their substance denser than that of other glandular organs, but they may be extremely pale or livid, owing to cadaveric stagnation of blood in them, without our being able to consider these appearances morbid.

When the kidney is divided longitudinally, it is found to consist of two substances—the *cortical* and the *tubular*, which differ in their situation, colour, consistence and texture. The outermost is the part that secretes—the truly glandular portion of the organ; the other—the inner—as its name imports, is composed of tubes, which convey the fluid, secreted by the cortical part, towards the hollow portion or pelvis of the kidney. The cortical substance is of a soft, glandular consistence, of a dusky red colour, and sends prolongations between the cones formed of the tubular substance. Careful examination exhibits numerous granulations, which are supposed to have similar functions with the granules of the liver. The tubular substance is of a rosy hue, inclining to grayish, and somewhat lighter than the cortical substance.

The kidney receives a large supply of blood by the renal or emulgent artery; its nerves are from the ganglionic.

The membranous duct, which commences at the pelvis of the kidney—the ureter—conveys the urine into the bladder. Its course must be borne in mind by the pathologist. It is about the size of a goosequill; descends through the lumbar region, dips into the pelvis by crossing in front of the primitive iliac vessels and the internal iliac, crosses the vas deferens at the back of the bladder, and, penetrating that viscus obliquely, terminates by an orifice, ten or twelve lines behind that of the bladder. The ureters have two distinct coats,—an inner or mucous, and an outer or fibrous, which—like the second coat of the gall-ducts—is liable to spasm, or is manifestly contractile.

The position of the bladder must be recollected:—it is in the pelvis, anterior to the rectum, and behind the pubes. Sometimes, however, one of the kidneys, instead of being in the lumbar region, is placed in the iliac fossa or in the pelvis,—a malformation which has been detected during life, both by remarking the tumour in the iliac fossa, and feeling that the kidney was absent from its usual place, on causing the patient to lean forward on his knees and shoulders in bed, and then grasping the loins. (*Rayer.*) At times, the kidneys are connected together by an extension of their substance across the spine, forming what is termed the “horse-shoe kidney;” and, occasionally, one kidney is altogether wanting. In such case, the other, having the whole of the urinary depuration to accomplish, is greatly hypertrophied.

The kidney has three coats—the peritoneal, which covers only the fundus and back part—the muscular, and the mucous.

The urine is retained in the bladder, as in a reservoir, until the desire arises for its expulsion, when it is expelled through the urethra.

In regard to many of the characters of healthy urine, much discrepancy exists amongst observers. These have been described elsewhere, (*Human Physiology*, 4th edit. ii, 306. Philad. 1841.) It may be sufficient to remark here, that on many of the topics, which must be looked upon as points of departure for the pathologist, it is impossible to lay down any exact standard. This applies to the specific gravity, which has been estimated at from 1.001 to 1.060 by one observer. (*F. D'Arcet*.) The same discrepancy exists as to the quantity of urine passed in the twenty-four hours, which may, perhaps, on the average, be estimated at two pounds and a half.

The varying conditions of the urine, in different pathological states of the urinary and other organs, are pointed out in the appropriate places.

It has been well observed, that it is interesting to remark the influence—*first*, of disease of one part of the urinary organs over the functions, and, ultimately, over the structure of others; *secondly*, of diseases of the spinal marrow over the secretion of the kidney; and *thirdly*, of affections of the urinary secretion over the state of the brain. (*M. Hall*.)

SECTION I.

DISEASES OF THE KIDNEY.

I. INFLAMMATION OF THE KIDNEY.

SYNON. Inflammatio Renum, Empresma Nephritis, Nephritis; *Fr.* Néphrite, Inflammation des Reins; *Ger.* Nierenentzündung, Entzündung der Nieren.

a. *Acute Inflammation of the Kidney.*

SYNON. Nephritis acuta.

Diagnosis.—Inflammation of the kidney is known by local phenomena, both of an organic and functional character, and, likewise, by phenomena exhibited sympathetically by other organs. A dull weight or pain is felt in one side of the lumbar region—when one kidney only is affected. This is sooner or later succeeded by an acute, pungent—at times lacerating—pain, which is deep-seated, and accompanied by a sensation of internal heat. The pain often extends from the loins to the ureters, bladder, and testicle of the affected side, and often to the groin and thigh, where it occasions numbness or a peculiar tremulous motion. The testicle is also, at times, painfully drawn up towards the abdominal ring. The pain is increased by the act of breathing, and if the patient makes a quick or false step, or experiences any kind of shock; and by pressure and percussion. If he be in bed, the examination may be made by placing him upon his back, pressing the fingers between the short ribs and the ilium, the thumb being

opposed to them on the corresponding part of the abdomen, or by causing him to lie upon his face, with the knees drawn up under the abdomen, and grasping the flank with one hand, or between both hands. In this manner, the kidney can be examined distinctly; and sensibility and tumefaction may, in general, be perceived. If the patient be not in bed, pain and tenderness can frequently be detected by percussion. (*M. Hall.*)

The urine is generally scanty, and red, during the first days; and, at times, bloody; and, when both kidneys are affected, it may be altogether suppressed. In other cases, it is watery, clear, and deposits a white, homogeneous sediment. At times, the pain intermits, or rather remits, to return again with perhaps increased violence. When this is the case, the nephritis is probably caused by a renal calculus, a probability which amounts almost to certainty, if sand or gravel be discovered in the urine.

Along with these symptoms, which are confined to the urinary apparatus, there is more or less febrile irritation, and, in almost all cases, the digestive apparatus greatly sympathizes; and the patient is affected with nausea and vomiting, uneasy sensation in the abdomen, with much flatulence, and often diarrhœa.

Acute nephritis, when properly treated, usually terminates by resolution, in from one week to three. It may, however, end in suppuration—*pyonéphrite*. (*Piorry.*) In such case, the pain becomes dull and heavy; a sense of weight is felt in the loins; the pulse becomes full and soft; and alternate chills and heats are experienced, succeeded by sweats. If, along with these symptoms, the urine becomes lactescent, and pus is deposited at the bottom of the vessel, the diagnosis is unequivocal.

The cellular membrane surrounding the kidney generally participates in the inflammation; and, frequently, the lumbar region becomes doughy and tumefied, followed by a distinct tumour, and deep-seated fluctuation. (*Andral.*)

When the disease terminates by suppuration, a large abscess sometimes forms, and the kidney becomes entirely disorganized. It may, however, discharge itself into the colon, or into the cavity of the abdomen, or form an abscess in the groin or at the margin of the anus. (*Andral.*) Gangrene is a very uncommon termination.

Causes.—Nephritis may attack all ages; but it is more common in the adult than in infants and old people. Men are said to be more frequently attacked with it than women; but, on this point, we need more accurate statistical information. Persons, born of gouty parents, or who are gouty themselves, are more liable to it than others. Climate is said to exert some influence, and this is probable. In the colder regions, the cutaneous depuration is diminished, and the urinary increased; the kidneys have, consequently, their activity augmented: hence it might be presumed, that nephritis would be more apt to occur in cold, moist climates, and seasons. If to this be added the use of stimulating drinks, which are more

common in the temperate and cold regions, we can readily understand, why nephritis should prevail to a greater extent in them than in the warmer regions.

The most common exciting causes of nephritis are—*First*, such as act more immediately on the kidneys,—for example, blows on the lumbar region, and wounds received on that region, which implicate the kidney. It has, also, been ascribed to violent succussions—as dancing, riding on horseback, or in a carriage without springs on bad roads. This is the *nephritis traumatica* of the German writers. *Secondly*, substances, which when taken into the stomach, or received in any manner into the circulation, irritate the kidneys,—as cantharides, absorbed from the stomach or from a blistered surface,—the oil of turpentine, oil of savine, and any stimulating diuretic. *Thirdly*, calculi in the kidney, especially such as are angular—the *nephritis calculosa* of writers. *Fourthly*, it is occasionally witnessed precursory or succeeding to an attack of rheumatism or gout,—the *nephritis metastatica* of writers; and *lastly*, the inflammation may extend from the bladder or urethra.

Pathological characters.—Occasionally, the kidneys are found, on dissection, to be unusually dark, their structure gorged with blood, their vascularity increased, and at times evidences of extravasation of blood. Such may be the case in the prodromic stage of acute nephritis, of granular disease of the organ, &c.; yet the affection may be nothing more than *hyperæmia of the kidney*,—*néphrohémie*. (*Piorry*.)

When the kidney is inflamed, it is generally larger than natural; but, at times, it is small; and, at others, the size seems to be little—if at all—modified. It is of a red—sometimes violet—colour, and gorged with blood; or, it may be pale and exanguinous. (*Rostan*.) Generally, its tissue tears with facility; but, at times, it is harder than natural. Occasionally, small, purulent collections are found here and there in the parenchyma; and calculi are found loose, or implanted in the substance of the organ, which their angular prominences have lacerated. If the inflammation has run very high, pus may be found collected in considerable abscesses, whence it may have passed into the calices and pelvis of the kidney.

The ureters sometimes participate in the disease. In such case, they are injected, and their mucous coat thickened.

When the injection affects one or other substance of the kidney, the appearances differ. If it be seated in the cortical part, the vessels form wreaths about the granulations; if in the tubular, the injection presents a striated appearance. When the inflammation is seated superficially, the affected parts can be readily distinguished by their deep colour, the arborescent arrangement of the capillaries, and the effusion of serous fluid beneath the fibrous envelope. (*Professor Gross*, of Louisville.)

The disease is very rare in its acute form, and, consequently, not many opportunities occur for necroscopic examination. The simple idiopathic disease yields generally to appropriate treatment; but

where it is intercurrent, or supervenes in the progress of urinary or other diseases, it is not favourable.

A recent writer, (*Rayer*,) who considers some form of nephritis to be an exceedingly common disease, distinguishes four varieties, according to the parts of the kidney that are involved—1. *Nephritis*, when the gland itself is inflamed; 2. *Pyelitis*, when the pelvis and calices are the parts inflamed; 3. *Perinephritis*, when the inflammation is in the investing membrane; and 4. *Pyelonephritis*, when both the pelvis and the granular structure are involved.

Treatment.—Like every other active internal inflammation, acute nephritis requires the vigorous employment of the antiphlogistic treatment. At the commencement, it may be necessary to draw blood freely from the general system, until the activity of the circulation is greatly diminished; even should it require twenty to thirty ounces, or more, to produce the effect. In this way, the inflammation may be, at times, cut short. Should the first bleeding be inadequate, and the inflammation and strength of the patient permit, the bleeding may be repeated in the course of six or eight hours; and, again and again, under proper cautions. Along with general bleeding, and especially in cases where the practitioner may hesitate as to the farther use of the lancet, the inflammation still continuing,—cupping, not over but around the region of the kidney, or the application of leeches, and, when they fall off, of cups over the leech-bites, will be found highly beneficial.

The warm bath, too, and emollient enemata, thrown up into the colon, act serviceably as fomentations.

When the inflammation is reduced in this manner, revellents may be used—as the croton oil, or ammoniated liniment over the region of the kidney; but blisters of cantharides and essential oils should be avoided, inasmuch as the cantharidine of the former, and the latter themselves, may pass into the mass of blood, proceed to the kidney, and excite great irritation there. From the commencement, too, gentle laxatives of castor oil may be administered, but the saline cathartics, which act at the same time as diuretics, should be avoided.

A question has arisen amongst therapeutists, as to the propriety of allowing diluent drinks. It has been argued, that they should be taken sparingly, especially when both kidneys are inflamed, in order that the inflamed organs may have as little secretory labour as possible. It has been advised, indeed, that the patient should quench his thirst by small pieces of cold orange. (*Roche*.) On the other hand, it has been argued, that the free administration of mucilaginous drinks assists greatly in diminishing the inflammation, and that the less the quantity of urine, the more it is concentrated as a general rule, and, hence, the more irritating. Much, therefore, may be said upon both sides; and, as has been observed, (*Andral*,) experience must pronounce definitively on the matter. The probability is, that either plan will answer, and that plain water is as beneficial as the mucilaginous drinks, that are almost

universally prescribed in such cases, inasmuch as the mucilage undergoes digestion in the stomach and small intestines, and the water alone passes into the mass of blood to be separated by the kidneys.

Should a renal abscess form in the lumbar region, it is important to open it, as soon as fluctuation is manifest. During the whole course of the treatment, the patient should be kept at rest; and the warmth of bed is advisable. The diet, during convalescence, should consist chiefly of farinaceous aliments.

b. *Chronic inflammation of the Kidney.*

SYNON. Nephritis chronica, Chrono-néphrite. (*Piorry*.)

Chronic nephritis may originate spontaneously and simply, or it may be occasioned by calculus, or succeed acute nephritis.

Diagnosis.—The symptoms greatly resemble those of acute inflammation of the kidney, except that they are by no means as severe. Pain is experienced in the region of the loins and in the groin, which may, or may not, be accompanied by retraction of the testicle, numbness of the thigh, and discharge of high coloured or bloody urine. These symptoms are continuous, and gradually affect the constitution materially, as indicated by hectic fever, and progressive emaciation, which may finally end in death.

In some of the cases of chronic nephritis, great obscurity exists in the diagnosis, inasmuch as the uneasiness is often mainly referred to the bladder, which may, notwithstanding, be healthy, yet so sympathetically irritated, that the patient may be compelled to evacuate his bladder every ten or fifteen minutes; and cases have occurred in which the operation of sounding has been practised over and over again, for a disease which was really seated in the kidney. An interesting case of this kind will be referred to presently.

Pathological characters.—These are much the same as in acute nephritis. In this form of the disease, extensive abscesses frequently occur, which destroy, at times, the whole parenchyma of the organ; breaking into the colon, or into the cavity of the peritoneum.

Treatment.—This must rest on the principles laid down under acute inflammation of the kidney. It will rarely, however, be necessary to employ general blood-letting. Cupping—not immediately over, but around—the region of the affected kidney, followed up by revellents,—as dry cups; frictions with the oleum tiglii or the ointment of tartarized antimony; mucilaginous diluents; farinaceous aliments; and oleaginous laxatives, will constitute the treatment.

When the affection is dependent upon renal calculi, it will require the treatment to be described hereafter.

II. HYPERTROPHY AND ATROPHY OF THE KIDNEY.

SYNON. *Fr.* Hypertrophie et Atrophie des Reins.

These conditions are more interesting to the pathologist than to the therapist. Hypertrophy—*Hypernéphrotrophie*, (*Piorry*)—

may affect one or both kidneys; commonly, however, it is met with only in cases in which one kidney only has existed; or where some cause has occasioned atrophy of the other. Atrophy of the kidney may be congenital, or it may result from compression excited by a tumour. Atrophy of the cortical substance may be induced by any cause that mechanically obstructs the flow of urine. In such case, the urine, not being able to escape, presses upon the pelvis and infundibula, and produces dilatation, and a surprising expansion of the cortical substance, which gradually spreads into a thin membranous sac. It occasionally happens, that—when the kidney has been, for some time, expanded into a sac of this nature, owing to a calculus obstructing the pelvis of the organ, and the calculus is not dislodged—after a time the urine which distends the kidney is absorbed; the membranous sac at the same time wastes, and shrinks, and is finally reduced to a mere capsule containing the stone. (*H. Mayo.*)

III. SEROUS CYSTS, AND HYDATIDS IN THE KIDNEY.

SYNON. *Fr.* Kystes et Hydatides des Reins.

These are not uncommonly met with,—especially some of a small size, which contain a transparent fluid. Their increase is supposed to be slow, and they generally induce but little irritation of the organ. At times, they are large enough to form a tumour, which presses upon the kidney, and occasions its atrophy. Many cases of extensive renal cysts are on record. (*Cæsar Hawkins, Sir B. Brodie, Rayer, Cruveilhier, Andral, Hope.*) They are extremely common in the hog, and have been well described by Dr. Gross, who, from his position at Cincinnati, had ample opportunities for observation.

If the tube of one of the papillæ be obstructed from any cause, it may become expanded into a cyst of considerable size, which is filled with urine. To this condition the term *Hydronephrosis* has been given by a recent writer. (*Rayer.*)

Not being indicated by any precise symptoms, it is, of course, impracticable to lay down any appropriate rule of practice.

To the head of serous cysts may be conveniently referred *hydatids*. Of these, the author met with an interesting example, which was complicated with extensive disease of the kidney of other kinds. This case was highly illustrative of the great irritation referred to the bladder, which is often induced by renal disease, when the bladder may be, notwithstanding, entirely healthy: with this view, he has referred to it elsewhere, (*General Therapeutics*, p. 305,) but it cannot be passed over here. A gentleman—himself a respectable member of the profession, in the service of his country—had long suffered under distressing irritability of the bladder, with occasional pain in the region of the kidneys, and, in one or two instances, with severe nephritic symptoms, which yielded to appropriate measures. A tumour gradually arose in the right

lumbar region, which could be distinctly felt on pressing the corresponding part of the abdomen, but its connection was so obscurely defined, as to occasion great doubts, as to its character, in the minds of many intelligent practitioners whom he had consulted. By most, indeed, the irritability of the bladder was supposed to be unconnected with the tumour, and the mischief was presumed to be vesical rather than renal. He had been several times sounded, but no calculus was found in the bladder. When Dr. Gibson, of Baltimore, and the author saw him together, he was passing a large quantity of albumen with his urine, which coagulated when heated to the necessary degree. This, along with the other phenomena, led to the belief, that the disease was in the *secreting*, and not in the *retaining* organ; and they felt satisfied, that the tumour belonged to, or was connected with, the right kidney. Under these views, he was put upon a palliative treatment,—everything being carefully prohibited, that could irritate the kidney. He was advised to try the revulsive influence of change of air, with which object he visited the Trans Allegheny region of Virginia, but the effects of organic irritation developed themselves with greater and greater intensity, so as to induce him to return to Georgetown, where he expired under symptoms of gastric and cerebral derangement; but no hydropic effusion supervened, as there was reason to anticipate, and as indeed might have happened, if his malady had been longer protracted.

On dissection—as the author was informed—the tumour was found to be—the right kidney extensively diseased, and containing a multitude of hydatids. The left kidney, too, was in a morbid condition, and had calculi imbedded in it; but the bladder, although contracted, was healthy; the whole of the distressing irritation in that organ—which prevented the patient from remaining, for the latter part of his existence, more than 15 or 20 minutes undisturbed in bed—being symptomatic of the renal mischief.

Like hydatids or acephalocysts found elsewhere, those of the kidney have a firm coat, composed of different layers, and have numbers of smaller hydatids within them, which are thrown off from the interior of the parent cyst—hence the name *Acephalocystis endogena*, which has been given to this species, to distinguish it from the *Acephalocystis exogena* of ruminant animals, in which the young vesicles are developed from the exterior of the parent vesicle. (*A. Farre.*)

These hydatids vary in size, from that of a hemp-seed to that of an orange; and they are occasionally discharged with the urine,—which affords the only clear evidence of their existence during life. (*Professor Gross, of Louisville.*)

IV. TUBERCLES OF THE KIDNEY.

SYNON. Tubercula renum; *Fr.* Tubercules des Reins; *Ger.* Tuberkeln der Nieren.

Tubercles of the kidney rarely occur, except in connection with tuberculosis of other organs, and are often absent when the

tuberculous diathesis is most marked. (*Andral*.) A case, indeed, has been lately published, in which they existed in great numbers without any being present in the lungs; but, from the history, doubts may be entertained, whether they were true tubercles. (*Professor Gross*, of Louisville.) "In the right kidney," says Dr. Gross, "of a young man of twenty-seven, who died last summer of psoas abscess, in the Cincinnati hospital, there were upwards of five hundred in the cortical substance, of all sizes between that of a mustard-seed and a cherry-stone. In some parts, they were agglomerated; in others, isolated. They were of a white opaque appearance, semi-cartilaginous in their consistence, and evidently organized,—since, in cutting through some of them, I could distinctly trace the existence of vessels, the blood standing upon the incised surface in minute dots. Externally, the organ had a dark mottled aspect, and, in its interior, were two tubercular excavations; one, situated in the superior extremity of the gland, was scarcely larger than a hazel-nut; the other, which occupied the lower half of the viscus, was about the size of a turkey's egg, and filled with thin, ropy, whitish pus, destitute of smell. The abscess was lined throughout by a thick layer of lymph; and, intersecting it in different directions, were four rounded cords, the remains, probably, of the tubular texture, which resembled a good deal the fleshy columns of the heart, or the bands which we so often see in tubercular excavations of the lungs. The kidney was very little enlarged, and some tubercular matter was also found in the excretory passages, the cavity of the ureter having been nearly obliterated by it. In this case, not a tubercle could be detected in the lungs. They were, indeed, perfectly sound, as were also the heart and brain, together with most of the abdominal viscera. Strumous matter was abundantly contained in the lymphatic ganglions of the pelvis, and the seminal vesicles were completely distended with it."

The existence of tubercles in the kidney can, of course, only be suspected by the general signs of tuberculosis along with renal irritation. The tubercular matter is found, at times, deposited in spherical masses, in the cortical substance of the kidney; at others, it is said to have been seen lining, as an exudation, the mucous surface of the infundibula, pelvis, and ureter, and to be commonly combined with dilatation of the cavities of the kidney, and expansion of its cortical substance. (*H. Mayo*.)

V. CANCER OF THE KIDNEY.

SYNON. Cancer Renum, Carcinoma of the Kidney; *Fr.* Cancer des Reins; *Ger.* Nierenkrebs, Krebs der Nieren.

This is a rare affection, and cannot readily be mistaken. It generally—perhaps always—occurs along with other signs of the cancerous diathesis. The tumefaction can be perceived, at times, during life, and usually there is more or less renal irritation, with hæmaturia.

In encephalosis or encephaloid disease of the kidney, the whole

organ is transformed, at times, into a soft pulpy mass, of the colour and consistence of brain. The diseased mass has been known to weigh nearly twelve pounds. In that case, the tumour was irregularly lobulated, and, on cutting into it, a large clot of blood was found, arranged in loose, concentric layers, as in a rapidly formed aneurism. (*Langstaff.*)

Often, in such cases, there is great pain and irritation in the kidney and bladder, and sympathetically in other organs: yet in some, even when the tumour is very large, there may be a total absence of all symptoms—direct and indirect—which could have caused a suspicion of renal mischief. Still, we should expect, that the countenance would generally exhibit the striking expression, which internal malignant disease so usually gives rise to. (*H. Mayo.*)

MELANOSIS OF THE KIDNEY has been observed, but never except when it existed in other organs.

VI. ENTOZOA IN THE KIDNEY.

SYNON. *Fr.* Entozoaires des Reins.

The presence of entozoa in the urinary organs of man is not common. They are very often met with, however, in the inferior animals,—exceedingly so, we are told, in the hogs that are taken to the slaughter houses in the environs of Cincinnati. (*Professor Gross, of Louisville.*)

Of the acephalocyst, as a parasite of the liver, mention has already been made.

The most common worm—indeed, almost the only one—discharged from the urinary organs, is the strongylus, which is generally met with, on dissection, in the pelvis and infundibula of the kidney, in which it is frequently coiled up in considerable numbers. Occasionally, it would appear to make its way into the parenchymatous structure, where it gives rise to suppuration, atrophy, or other mischief. (*Professor Gross.*) Recently, a collection of these worms was presented to the Pathological Society of Philadelphia, which had been discharged from the urethra of a man in the state of North Carolina. They were twelve to fourteen in number, and about ten or twelve lines long, and one line in diameter. They were discharged periodically; and their exit was preceded by much suffering. (*Professor Horner, of Philadelphia.*)

Of late, another species of worm has been discovered in the urine, to which the name *Dactylius* has been given, (*Curling,*) and in a single case, the *Diplosoma crenata* and the *Spiroptera hominis* were discharged from the bladder of a female. (*W. Lawrence.*) It is the only recorded instance of either of these entozoa having been met with in man. (*A. Farre.*)

Should their presence be suspected by the discharge of one or more, the others might, perhaps, be dislodged by the animal oil of Dippel, or congenerous substances, which pass into the circulation and are separated by the kidney. The oleum terebinthinæ might be very efficacious in such cases.

VII. GRANULAR DISEASE OF THE KIDNEY.

SYNON. Morbus Brightii, Nephritis albuminosa, N. albuminensis, Disease of Bright, Bright's Disease, Granular Degeneration or Disorganization of the Kidney; *Fr.* Maladie de Bright, État granuleux du Rein, Albuminurie, Albuminorrhée. (*Piorry.*)

Although this lesion of the kidney, and its connection with dropsy, were not first suspected by Dr. Bright, the disease cannot be said to have been received amongst the fasti of medical science, until the year 1827, when Dr. Bright, in his Reports of Medical Cases, affirmed, that dropsy frequently depends upon a peculiar degeneration of the structure of the kidneys, and that this change of structure is likewise attended by a liability to other diseases, more especially of an inflammatory character, and indicated by *albuminuria*, or the presence of albumen in the urinary secretion. "It was afterwards found,"—says a writer on this disease, (*Dr. Christison,*) "as in regard to many other important discoveries in pathology, that various authors had previously made observations, which, if followed out, might have led them to the general principles established by Dr. Bright. Among these, the names of Dr. Blackall, Dr. Alison, Professor Andral, and especially of Dr. Wells, may be deservedly mentioned. It is not, however, by a few fortuitous observations, and, still less, by obscure and incomplete inductions, that the merit of an original discoverer in medical science is to be either gained on the one hand, or lost on the other. Formerly, physicians were in possession of only a few scattered facts and dubious inferences, respecting the connection between dropsy and diseased kidney, and these were almost disregarded, alike in science and in practice. Now, they may become intimately acquainted with a disease of extreme frequency, which manifests itself by characteristic symptoms, and singularly modifies and engenders a great variety of other long familiar maladies. For this important step in the progress of knowledge, medicine is indebted to Dr. Bright,—together with those inquirers, whom his discovery has called forth, to explore with more minuteness the regions he has pointed out."

Diagnosis.—The symptoms of granular disease of the kidney have been arranged under the following heads;—local pain and other local uneasiness; disordered digestion; diseased state of the urinary secretion; derangement of the general circulation, together with an altered condition of the blood; leucophlegmatia; and a variety of secondary or incidental affections of textures and organs at a distance from the primary seat of disease, amongst which the most frequent are;—œdematous effusion into the cellular tissue, serous effusion into the serous sacs, inflammation of the serous membranes, bronchitis, diarrhœa, rheumatism and affections of the brain. These symptoms are variously grouped in particular cases, arising, in part, from the disease being, at times, acute, at others, chronic; and, in part, from the great number and complexity of the secondary disorders.

In the acute form of the disease, along with general symptoms

of pyrexia, the urine may be very scanty, and, at times, altogether suppressed. That which is discharged, is, however, highly albuminous, and, occasionally, although rarely, mixed with blood.

There is, along with these symptoms, often an uneasy feeling, and, at times, positive pain in the region of the kidney, with great irritation about the bladder, so as to lead to the belief, that the mischief is vesical rather than renal. This pain may be augmented on exerting pressure or percussion over the region of the kidney.

As in other affections of the kidney, the stomach and bowels usually sympathize, so that nausea and vomiting are of common occurrence, with more or less derangement of the intestinal functions. These symptoms do not continue many days without the secondary affections of dropsy, especially of the limbs and face, coma, with or without convulsions, and acute serous inflammations, more especially pleurisy. Dropsical effusion, especially, is seldom long absent, and, when it occurs, it assumes the character of inflammatory or active dropsy.

This form of the disease may prove fatal in a few days, or it may be checked by appropriate active treatment, but, what is more likely, the active symptoms may pass away, and those of the chronic state take their place.

The chronic form of the disease may be such from the onset, but it may also be the sequel of the acute form. The disease may be proceeding on obscurely, and may be indicated by little more than gradually increasing debility, with great paleness and other signs of ill health, and no suspicion may prevail that the kidneys are affected, until the occurrence of some secondary disorder may unequivocally announce the existence of the renal mischief. When the patient is then interrogated, he may reply that he has experienced more or less irritation—at times very trivial—about the urinary apparatus, which may have required him to rise from bed once, twice, or oftener during the night, to empty the bladder. This condition may endure for a long period,—for even years; or, accidental circumstances may light up the acuter symptoms already described, or give rise to some of the secondary disorders. The essential disease is, however, considered to be distinguished by the following indications. (*Christison.*) Reduction of strength; emaciation, not always, however, considerable; remarkable uniformity of the complexion; and, commonly, great paleness; or, on the other hand, at times, a peculiar pale brownish dinginess of colour; defective transpiration, as indicated by dry skin, and want of perspiration under exercise; often, a tendency to drowsiness; frequently, too, weakness of digestion, or even well marked dyspepsia, not unusually attended with sickness, or retching, in the morning, on awaking from sleep; thirst,—together with an important pathological condition both of the urine and of the blood, and, sometimes, more or less irritation about the urinary organs. Of these symptoms, none would seem to be invariable, except the altered condition of the urine and blood, with perhaps also the unhealthy complexion.

(*Christison.*) On the last symptom, however, obviously not much reliance can be placed, but the two former are pathognomonic.

In the early period of the disease, the urine is generally greatly diminished in quantity; and, at times, nearly or altogether suppressed. The last symptom is a serious one, and is usually followed by fatal encephalic disease. When the fluid is very small in quantity, it is generally very high coloured, and bloody. Most commonly, however, its appearance is healthy; and, at times, a sediment forms as it cools, which is generally lithic acid or lithate of ammonia. Occasionally, a phosphatic sediment has been observed; but this is rare, except as the result of the alkaline condition, induced by long standing, and consequent decomposition. Generally, the urine froths more than usual when shaken; and, on blowing into it through a tube, bubbles are formed as in soapy water. This property is confined, however, to urine that is loaded with albumen. (*Christison.*) At this stage of the disease, the specific gravity does not differ much from the natural standard. It is usually from 1021 to 1028—the average specific gravity of healthy urine, according to Dr. Christison, being 1024 or 1025. It is very seldom so low as 1016, unless where its quantity is greater than natural, and it can be understood, that where this is the case, the specific gravity will usually be less. At this stage, therefore, if we admit, that there is a reduction of density, it is to a slight extent only; but, at the same time, the urine, on the application of the appropriate tests, to be described presently, exhibits, that it contains a large quantity of albumen, and, along with this, an unusually small quantity of its solid ingredients; for, although the density of the fluid may be as high as 1020 or even 1024, this is partly owing to the albumen, which is a foreign component; and when the fluid is filtered after the coagulation of the albumen, the specific gravity is found to fall four, five, or even seven units. (*Christison.*)

When the disease is greatly advanced, the quantity of urine is often but little less than in health; and, at times, far exceeds the healthy standard. Its appearance is much the same as in the early stages; and the same kinds of sabulous deposits may be met with. The density is, at this period, invariably much reduced. As the granular deposition proceeds, the density falls from the normal point, before mentioned, to 1016, 1014, 1012; and in the advanced stage, it is commonly as low as 1010, 1008, or 1007, even when the quantity secreted is rather under than over the healthy standard. (*Christison.*) The lowest density, ever noticed by Dr. Christison, when the quantity was not in excess, was 1004. A density of 1003 was once met with, but the quantity of urine discharged was 44 ounces. (*Martin-Solon.*) It need hardly be said, however, that, owing to the varying specific gravity of the urine, it is difficult to deduce any exact inferences from it. (See page 78, of this volume, and the author's *Human Physiology*, 4th edit. vol. ii. p. 306. Philada. 1841.)

The most remarkable property of the urine throughout the dis-

ease is its coagulability under the action of heat and the nitric acid, owing to the presence of albumen. By the generality of chemists, it is not admitted, that healthy urine contains any albumen; but, in particular disordered conditions of the frame, mentioned elsewhere, and especially in the disease now under consideration, the quantity of albuminous impregnation is, at times, very great.

The presence of albumen in the urine may be detected by various chemical tests; but the combination of coagulability by heat and by nitric acid affords decisive evidence. The sources of fallacy, at least, are so few, that little or no doubt can exist, after the fluid has been subjected to their action. At a temperature between 160° and 170° of Fahrenheit, the urine becomes turbid, and complete coagulation of the albumen is observed to take place. If any deposition of lithic acid, or of lithate of ammonia, exists in the cold urine, it is dissolved; and the urine, as it becomes warm, becomes likewise clear. Should the urine be turbid from mucus, it does not become clear in this manner: in such case, the fluid may be filtered, before testing it farther. When the quantity of albumen is considerable, the urine will sometimes form a gelatinous mass; at others, it is like custard; and at others, again, the fluid is merely rendered flaky. Yet even when it is present in the largest amount, the proportionate weight of albumen to urine is very trifling. Ten parts by weight in a thousand will render it almost a uniform pulp when heated. (*Christison.*) A recent writer, (*British and Foreign Medical Review*, July, 1839, p. 132,) has affirmed, that the combination of three characters is necessary to afford incontestable evidence of the presence of albumen;—coagulability by heat and by nitric acid, and nonprecipitation by acetic acid. If urine contains milk or casein, naturally or by artificial introduction, it will coagulate by heat, and afford a precipitate when nitric acid is added; but, unlike albuminous urine, it will coagulate on the addition of acetic acid. When albuminous urine, again, is alkaline—for example, after long standing—it does not ordinarily lose its transparency when heat is applied, unless the quantity of albumen be considerable; and even in this case it assumes only a milky hue. The addition, however, of a certain quantity of nitric acid will cause instantaneous coagulation; and if sufficient nitric acid be added to neutralize the alkalies, the urine may then coagulate by heat. (*Rayer.*)

When alkaline urine is rendered turbid by heat, the loss of transparency is generally owing to the precipitation of phosphates, as the transparency is completely restored on the addition of nitric acid.

On the other hand, precipitation by nitric acid alone will not establish, that the matter thrown down consists of albumen. It may, indeed, be composed of lithic acid or lithate of ammonia. This is said to be a source of very common error. The precipitate of lithic acid or the lithates is, however, redissolved by an elevation of temperature, whilst albumen remains insoluble. (*Christison.*)

Along with the albuminous condition of the urine, a material change is observed in the condition of the blood in the disease under consideration. The most remarkable is a great decrease in the density of the serum, along with a corresponding reduction of its solid contents. This seems to be an invariable character in the early stage; and, with certain exceptions, to be peculiar to that stage. (*Christison.*) The average specific gravity of the serum, in health, may be estimated at about 1027; whilst, in granular disease of the kidneys, it rarely exceeds 1022; and the solid contents are reduced from 100 or 102 in 1000, to 68 and even to 61. It is proper, however, to remark, that great discrepancy exists among observers, as to the density of the serum of the blood in health. (See the author's *Human Physiology*, 4th edit. ii. 62. Philad. 1841.)

The serum of the blood in this disease is farther characterized by the presence of a large quantity of urea, which can be detected at all periods, but more especially in the early stages. In these stages, too, there would appear to be a frequent increase of the fibrine of the blood, without the proportion of the hæmotosine being affected, whilst in the advanced stages, the proportion of the hæmotosine seems to be always greatly reduced—no other morbid change being invariably occasioned: frequently, however, the solid contents of the serum are likewise defective, whilst they are sometimes, on the contrary, in excess, and not unusually—especially if the disorder be far advanced—the serum likewise contains urea. (*Christison.*)

It has been remarked, that one of the evidences of granular degeneration of the kidneys is coagulability on the application of appropriate reagents; and by many it has been presumed, that the presence of albumen in the urine is always associated with positive disease in those organs. The fact, that dropsy is accompanied by albuminous urine has been long known, and was, at one time, ascribed to a general inflammatory state of the system, or to some distinct local inflammation demanding antiphlogistic measures. (*Cruikshank, Wells, Blackall.*) This view has undergone a mutation of late years, and the albuminous secretion is now ascribed to inflammation, or to decided organic derangement of the kidney. (*Bright, Gregory, Christison, Rayer.*) Observation has, however, sufficiently shown, that the urine may contain albumen without the kidneys being thus diseased. It has been denied, indeed, on good authority, (*Graves,*) that the albuminous state of the urine, in dropsies, always, or even generally, depends on structural change in the kidneys. Dr. Graves remarks, that he has seen so many cases in which the albuminous state of the urine entirely and speedily disappeared under the influence of proper treatment, that the only inference he could draw was, that this state frequently depends on mere functional derangement of the secreting organ. He was even led to prescribe opium and animal diet in some cases of dropsical effusion with albuminous urine, with the very best effects. Upwards of two years ago, the author was induced to

draw extremely unfavourable inferences as to the result of a case of anasarca, with some degree of ascites, on account of the copious secretion of albumen by the kidneys, yet, under appropriate management, the dropsy disappeared, and along with it the albumen in the urine, and the individual has remained free from dropsy for more than two years. Certain medicines—as mercury, and excitant and saline medicines—are said by some to have induced this condition of the urinary secretion. The observation, indeed, of many eminent practitioners, by no means countenances the idea, that structural derangement of the kidneys always exists in these cases. (*Mackintosh, Elliotson, Martin-Solon, Copland, Robert Willis, Darwall, Forget, Morrison, Toulmouche.*) Martin-Solon presumes, that a connection exists between the appearance of albumen in the urine, and the establishment of a favourable crisis, in acute febrile, and inflammatory diseases. He found, that in some cases the urine coagulated both by heat and nitric acid;—precisely as in granular disease of the kidney; whilst, in other cases, it appeared to coagulate by nitric acid and not by heat, the precipitate redissolving during ebullition. In the first cases, the coagulum was no doubt formed of albumen; in the latter, the precipitate consisted of lithate of ammonia. This, indeed, was farther proved by examination with the microscope, by M. Donné, who has employed this instrument successfully, to discriminate the presence of salts, or pus, or blood in the urine.

Diseases.	Number of Cases.	Coagulability.					
		Not produced by any reagent.		Produced			
		A.		By Heat. B.		By Nitric Acid. C.	
		Recovered.	Died.	Recovered.	Died.	Recovered.	Died.
Intermittent Fever.	8	1	0	2	0	5	0
Measles.	7	2	0	1	0	4	0
Variola.	11	6	0	1	0	4	0
Scarlatina.	3	1	0	1	0	1	0
Pemphigus.	1	0	0	0	0	1	0
Typhoid Fever.	23	3	1	3	1	15	0
Bronchitis.	1	0	0	0	0	1	0
Pleuropneumonia.	24	2	0	2	0	17	3
	78	15	1	10	1	48	3

These facts are obviously opposed to the prevalent view, that albuminuria is diagnostic of the disease of the kidney, which is now under consideration.

To arrive at still more satisfactory information on this matter, the author instituted experiments on the urine of different patients in one of the wards of the Philadelphia Hospital. These were examined, at his request, by Dr. M'Kee, of North Carolina, at the time resident physician of the ward. Eleven cases were observed; of these, 2 laboured under dysentery; 2 under bronchitis; 2 under phthisis pulmonalis; 2 under pleuritis; 1 under ascites; 1 under

hypertrophy of the heart; and 1 under purpura. Each individual's urine was tested separately, and but two found to produce a coagulum by heat, and an albuminous precipitate with nitric acid. These were cases of dysentery. In both, the quantity of albumen was considerable; but in neither case was there the least reason to suspect renal disease.

Since these examinations were instituted, (*American Medical Intelligencer*, July 1, 1839, p. 97,) some remarks have been made on the uncertainty of the diagnostic signs of albuminuria. (*Toulmouche*.) M. Toulmouche details two cases of albuminous urine. In both, the lining membrane of the bowels was affected: in the one, there was chronic enteritis with ulceration; and, in the other, ulcerations and tubercles in the jejunum and ileum, with larger ulcerations in the cæcum and colon. In the latter patient, however, there were, also, the first signs of granular degeneration of the kidney.

It is evident, then, from all that has been said, that we cannot with certainty infer the existence of any particular organic disease of the kidney, from the presence of albumen in the urine.

Causes.—The causes of granular derangement of the kidneys—as of every chronic ailment—are necessarily obscure. In the darkness of the subject, exposure to cold is generally invoked. A recent writer, (*Osborne*),—on insufficient grounds, we think—refers 22 out of 36 cases, to suppressed perspiration from exposure to cold; and it has been remarked by another writer on this disease, (*Christison*), that where cold was not the apparent cause, he has never met with an instance where the patient could ascribe his illness to any thing else. In four of the cases, however, which came under the notice of another observer, (*Martin-Solon*), the cause to which the patient referred his complaint, was a blow on the loins. A large proportion of cases would appear to have occurred in habitual drunkards, or those who have indulged freely in ardent spirits. It has been estimated, that as many as three-fourths, or even four-fifths, of the whole number of cases, are referable to one variety or other of intemperance. The disease occurs, however, in individuals of entirely temperate habits, and, consequently, other causes than the irritation of excitants on the kidneys, are capable of inducing it. Where it is met with in those of regular habits, characteristic evidences have generally existed of their being of the strumous constitution. (*Christison*.) Dr. Christison has, indeed, been disposed to suspect the strumous diathesis to be the prime and only essential condition, and intemperance to be no more than an accessory predisposing cause in any case. It certainly would appear, that the disease is, in no circumstances, developed with greater certainty than where habits of intemperance have been engrafted upon a strumous taint of the constitution. (*Christison*.)

It would seem, again, that this disease of the kidney occurs as a secondary affection in many diseases,—as phthisis and scarlatina. Of ten fatal cases of phthisis, where the body was examined, granular

derangement coexisted in no fewer than five. (*Martin-Solon.*) In scarlatina, where albuminuria exists, the kidney may not always be diseased, and the albuminous secretion disappears as recovery takes place.

In those who are predisposed to the disease, it would seem that mercury, cantharides, and other excitants of the kidneys, may act as occasional causes; but, whether they can induce the disease in the absence of such predisposition, demands farther investigation.

Sex certainly appears to afford a predisposition, males being more liable to the disease than females,—some say in the ratio of three to one, (*Tissot, Andral;*) but this, it has been imagined, is owing to the constitutions of the former being more undermined by intemperance, and to their being more subjected to cold with atmospheric vicissitudes. (*Christison.*) Age, also, affords a predisposition, and, it has been imagined, upon similar grounds. The disease now under consideration, is most frequent between the ages of thirty and fifty, and so is intemperance. At the same time, it has been met with at ages when intemperance was out of the question, for example, at five years, and between that and ten, (*Christison, Sabatier, Rayer,*) in some cases as a sequel of scarlatina; and an unequivocal case has been seen in an infant of eighteen months. (*Martin-Solon.*)

With regard to the prognosis in this disease, it of course varies according to the degree of granular disorganization, and this is pretty well measured by the density of the urine: when it is very low, the organic mischief is, of course, great. At the same time it will have been understood, from what has been said, that albuminuria may exist without serious mischief of the kidney, and may be merely an index of a favourable change occurring in some acute malady. Where the kidney is really diseased to a great extent, the prognosis must be very unfavourable. Sooner or later, it is sure to induce serious secondary disorder. In fact, the disease of the kidneys rarely ends fatally, except through the intervention of one or other of them. The most serious secondary disorders are inflammation of the serous membranes, chronic vomiting, diarrhoea, tubercular liver, valvular obstruction of the heart, and, above all, coma. (*Christison.*) At the same time, the secondary symptoms themselves, under appropriate management, may be occasionally removed, and the patient afterwards enjoy tolerable health. (*Christison.*) Very recently, a case of this kind has fallen under the author's attention; and Dr. Bright has affirmed, as the result of his latest observations, that, with care, life may be prolonged many years; and, without care, may be materially shortened.

Pathological characters.—They differ essentially, according to the stage in which the malady proves fatal. These have been divided into three; 1. The incipient, which is in some instances—if not in all—a state of congestion or reaction. 2. The middle stage, in which the cortical substance is nearly or wholly destroyed; and 3. The advanced or final stage, in which the tubular portion is likewise invaded, and more or less obliterated. (*Christison.*)

In the first stage, the characteristic alterations are not readily traced. When the disease proves fatal in the early period of the acute stage, the kidneys are often found flabby, friable, and unusually large,—at times, more than twice the natural size; much darker and more vascular externally, and with points and starlike spots of ecchymosis; internally, dark, brownish red, or almost reddish black, gorged more or less with blood, which exudes copiously from a cut surface; and they frequently present throughout their whole structure, but more especially in their cortical portion, lines, small roundish specks, or stellated spots of still darker colour, like ecchymoses, and not easily removed by washing. (*Christison.*) These spots have been supposed to be the Malpighian glands, in a state of congestion. (*Rayer.*) The cortical substance almost always seems greatly broader than in the healthy state. Occasionally, too, there is, in the cortical substance, the appearance of granular matter, of a dark reddish yellow tint, deposited here and there. The lining membrane of the pelvis of the kidney is commonly very vascular and red. The bladder is always found much contracted, and commonly contains only a drachm or two of urine, which always possesses the characters already described.

The appearances, in other organs, of course vary according to the precise nature of the secondary affection.

The second stage is characterized by the deposition of granular or cheese-like matter, confined, for the most part, at first, to the cortical substance of the kidney chiefly. As this deposit takes place, the natural structure of the kidney gradually disappears. Still, the tubular structure may remain unimplicated. The size of the kidney, in this state, varies; sometimes, it is natural; at others, larger than natural; very rarely diminished. The consistence and colour vary; and, when the investing membrane is removed, which may be generally done with facility, the outside of the kidney is seen to be more distinctly mottled brown or gray, or else uniformly grayish or yellowish, with numerous vascular spots often forming lines of stellated chequerings. The surface has, consequently, a granular appearance, and is often rough from a granular structure. When a section is made of the kidney, the cortical substance, instead of presenting its natural appearance, is grayish, grayish red, grayish yellow or reddish yellow, without any striated arrangement, and of a uniform granular texture, chequered, occasionally, with reddish or brownish spots. When the kidney is injected, the matter of the injection does not enter into the granular structure. (*Bright.*)

The granular structure of the morbid formation is, at times, distinct; at others, it requires the aid of a lens to distinguish it, when the morbid tissue is torn; and, in other cases, a smooth, homogeneous structure, like that of the brain, is alone perceptible; whilst, in others, again, the structure is homogeneous and friable, and not unlike the fatty degeneration of the liver, without there being any fatty matter in it.

The granulation of the cortical substance of the kidney may exist to a great extent without the tubular being affected.

In the third, or most advanced stage of the disease, the morbid deposition implicates, also, the tubular portion of the kidney; occasioning, in both, an absorption of the healthy structure, and a morbid formation in its place. Generally, in this stage, the kidneys are diminished in size, although they are, at times, of natural size, and, at others, larger than natural. The surface is usually rough and irregular, and has been compared to the roe of the salmon, or the mineral grisolite. (*Christison.*) The common external colour is pale grayish-yellow. The consistence varies greatly from the healthy to the almost cartilaginous. (*Bright.*) A section of the kidney exhibits the cortical substance entirely occupied by grayish-yellow granulations, or by a homogeneous substance, something like the fatty degeneration of the liver; the same matter is deposited between the tubular masses and often among the tubuli; the tubuli themselves are of a pale flesh-red colour, more finely striated than usual, compressed, broken up, and some even obliterated, their place occupied by the morbid deposit. At times, one kidney has been found wholly converted into the granular deposit,—the ureter being consequently useless; and it has been seen obliterated. (*Martin-Solon.*)

The renal veins often present firm fibrinous clots, extending into their ramifications, and occasionally adherent. (*Rayer, Osborne, Christison.*)

Sometimes, on dissection, the kidneys alone are found to be diseased, but, more commonly, there is a complication of morbid appearances, differing according to the precise organs concerned.

By those, who look upon all morbid degenerations to be the result of chronic inflammation—a view, which appears untenable—the granular disease of the kidney has been thus regarded:—hence, the term *Nephritis albuminosa*, which has been given to it by some. It has been supposed to be owing to an hypertrophied condition of the granulations, which are presumed, by Malpighi and others, to exist naturally in the cortical substance, and hence to be analogous to the mammillated liver. (*Professor Gross, of Louisville.*) Andral remarks, that he has seen the granulations, in one instance, in the tubular structure; but Dr. Gross thinks this is probably a mistake. “According to the theory we have advanced above,” he observes, “they should always be confined to the vascular substance, and this—as we are informed by Bright, is uniformly the case.”

The invasion of the tubular structure by the granulations cannot, however, be doubted. The fact has been recorded on excellent authority, (*Christison.*) and the author has recently had a case, in which it was incontestable. Like other morbid degenerations, the granular is owing to a *vice* of the system of nutrition, which is inexplicable.

Treatment.—When the symptoms are manifestly acute, it may

be necessary to take away blood from the general system, and to repeat it, should the symptoms appear to render this necessary. In many cases, however, especially when the practitioner is not consulted until the signs of debility have become marked, the patient will be found not to bear well the copious abstraction of blood. In such cases, cupping over the region of the loins affords the advantages of both depletion and revulsion. The good effect of this, as of other remedies, is exemplified by the relief of uneasy symptoms, by the urine losing more or less of its coagulability, and maintaining or increasing its density.

When the force of the circulation has been reduced by general or local bleeding, or both, as well as by the adoption of the whole antiphlogistic treatment, revellents—as frictions with the tartarized antimony ointment or croton oil, or even the irritation produced by a seton—afford essential benefit. The objection to blisters with cantharides applies here with equal force as in nephritis, especially, as, according to some, albuminuria may be actually induced by cantharides, or their active principle, received into the system.

Under the idea, that the disease commonly recognizes for its cause, cold and moisture, and is, therefore, dependent upon suppressed perspiration, (*Osborne*), diaphoretics have been highly extolled. The vapour bath has been recommended, (*Rayer*), as well as diaphoretics generally. (*Osborne*, *Bright*, *Christison*.) The pulvis ipecacuanhæ et opii. (gr. v.—viij, ter die,) has been advised along with the warm bath every 24 or 48 hours. Saline diaphoretics are properly regarded to be unadvisable, as they are more apt to pass off by the kidneys than by the skin.

It is extremely questionable, however, whether obstructed diaphoresis is amongst the causes of albuminuria, and whether it ought not rather to be looked upon as an effect. When, therefore, the entire surface is restored to a perspiring state, and recovery follows, it is more probable, that the morbid cause of the suppression of perspiration having yielded, the consequence—the suppression itself—yields likewise. This, however, can be esteemed only as a general rule; for it will be often found, that general perspiration, both spontaneous and apparently produced by reputed diaphoretics, will fail to produce any material relief. (*Christison*.) They cannot, certainly, be regarded as efficient agents; still, whilst they are taken, the patient is always subjected to quietude and other management that may exert a decidedly beneficial influence.

Cathartics do not afford any essential aid in the management of this disease, and can only be employed to relieve existing constipation. Aloes,¹ or colocynth,² may be used for this purpose.

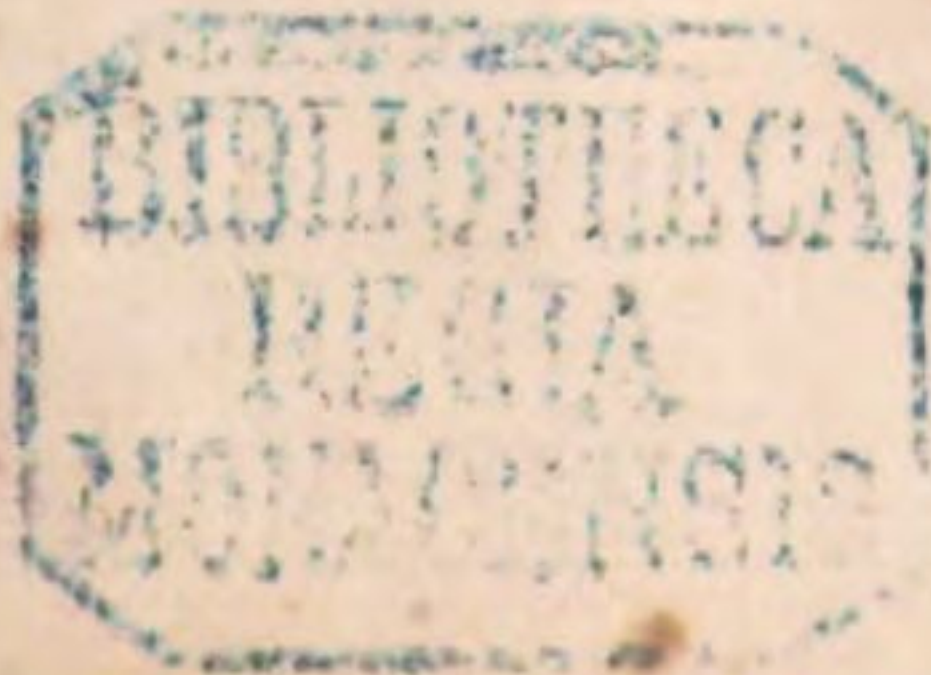
¹ R.—Aloes,
Sapon. ãã partes æquales.—
Fiant pilulæ gran. quinque
singulis.

Dose, two pills, at bedtime.

² R.—Ext. colocynth. comp. part ij.
— hyoscyam. p. j.—M. et
fiant pilulæ gran. quinque
singulis.

Dose, two, at bedtime.

Where, however, signs of severe encephalic mischief supervene,



other active cathartics may be needed, which might not be esteemed proper in mere granular disease, owing to their affecting the kidneys also as diuretics.

Of diuretics, the same sentiments have not been entertained by all therapeutists. They have generally been regarded as unadvisable, especially in the early periods of the disease; but they are recommended by one observer, (*Rayer*), and especially the decoction of the cochlearia armoracia. Notwithstanding the ingenious argument of Dr. Christison,—that an agent, which increases the secretion of an organ may not add to existing disease in that organ, diuretics must be considered as equivocal remedies, and, on the whole, he is desirous of so regarding them in relation to the disease under consideration; but he is of opinion, that the “dread of an evil influence from them over the primary disease has led several estimable authorities to forbid their employment likewise in all secondary affections, in some of which no other remedies are so promptly efficacious.”

As a revellent, mercury has been advised by at least one practitioner, (*Martin-Solon*); and if there were no special objection to it, the remedy would seem to be as well adapted for the removal of this glandular lesion as of many others for which it is prescribed. It must be borne in mind, however, that mercury is considered, by some, to induce albuminuria; and, moreover, it is affirmed, that the effect of mercury on the mouth is developed with extreme facility in this disease, and that, when once induced, it is apt to be uncontrollable and violent; whilst it has not proved of any service to the primary affection. (*Bright, Christison*.) If employed at all, it should be under a wise caution.

When the disease has passed the acute stage, or when it appears to be chronic from the first, but little can be done. Revellents may, however, be employed from time to time; and everything should be avoided, that could irritate the kidneys. Food, easily digestible, nutritious, and not in too great quantity, with total abstinence from spirituous liquors; warm clothing, with flannel next the skin; the occasional use of the warm or vapour bath; the avoidance of all irregular exposure to cold and moisture, with regular exercise whenever the weather will admit of it, are the agencies, which may prevent the extension of the organic mischief, and the supervention of the secondary affections.

Should any of these supervene, they must be treated by means that are appropriate to them, bearing in mind the existence of the primary mischief, but not allowing it to interfere with the employment of important therapeutical agencies, should the advantage, to be derived from them in the secondary and more serious disease, preponderate over the supposed injury they might inflict on the primary. In some cases of pleurisy supervening on granular disease of the kidney, the symptoms have been so masked as not to be readily detected by the ordinary symptoms. This fact must be

borne in recollection, and frequent attention be paid to the physical signs.

VIII. NEURALGIA OF THE KIDNEY.

SYNON. Neuralgia Renum, Nephralgia; *Fr.* Névralgie des Reins, Néphralgie, Dysnéphronervie, (*Piorry*;) *Ger.* Nierenschmerz.

Severe pain in the kidney is a concomitant of many diseases of the organ,—as nephritis, granular disease, and especially of renal calculi. The nerves of the kidney are doubtless also liable to attacks of true neuralgia, which can only be suspected, when excruciating pains in the region of the kidney alternate with neuralgia in other parts of the economy. (*Piorry*.) Should it exist, it is amenable to the same treatment as directed under Neuralgia of the Liver.

IX. CALCULOUS FORMATIONS IN THE KIDNEY.

SYNON. Calculus Renum, Nephrolithiasis, Lithia renalis, Lithiasis nephritica, L. Renalis, Renal calculi, Gravel, Sand; *Fr.* Calculs rénaux, Gravelle; *Ger.* Nierenstein, Harngries, Harnsand.

The urine contains, in the healthy state, several constituents, which are occasionally deposited in the kidney, or in some part of the urinary organs, whence they may ultimately pass into the bladder, often giving rise to a train of painful symptoms, known under the denomination of a “fit of the gravel;” at others, they excite acute or chronic nephritis; and at others, after having passed along the ureter, and occasioning intense irritation, they remain in the bladder, giving rise to stone in that organ. Or, again, calcareous concretions may form in other parts of the urinary apparatus, or not until the urine is discharged. All these will require a distinct consideration; in the first place, however, it will be proper to make inquiries into the nature of urinary calculi, and the calculous diathesis in general—*Urolithiasis, Lithia, Lithiasis*; *Fr.* *Calculs urinaires*; *Ger.* *Steinkrankheit in den Harnwerkzeugen*.

In the healthy condition, the urine lets fall but little precipitate, until it undergoes decomposition. Such, however, is the case only in perfect health. Any irregularity of the functions of innervation, circulation, or digestion, disturbs this condition; the appearance of the urine becomes changed, and a pulverulent substance falls to the bottom of the vessel; or reddish brown crystals are observed scattered about its sides and bottom; but the derangement is temporary, and it passes off as the effects of the accompanying or preceding disorder disappear. Such is not the case with the depositions, that are the result of a calculous diathesis; which often appears to be dependent upon an organization, derived from progenitors, but is frequently also acquired.

That the calculous diathesis is connected with a morbid state of the discerning function of the kidney is clear. The organ forms that which it ought not; and the urine deposits matters contained in it, very different from what it does in health. This *vice* of secretion is, however, greatly connected with a morbid condition

of other organs; the whole system of nutrition appears, indeed, to be morbidly implicated; the gastric functions are imperfectly performed; the nutrition of the body is impaired; and, in the phosphatic diathesis especially, when it is greatly developed, every symptom is present, which is considered to denote dyscrasy or cachexia.

The ordinary urinary calculi arise from the deposition of matters contained, in greater or less quantity, in the urine in a state of health, but rendered insoluble owing to circumstances to be enquired into presently; some, however—as the mulberry, which is composed of the oxalate of lime—do not exist in the urine in health, and must, consequently, be separated, or formed from the blood by the kidneys. It is probable, however, that the fault is not altogether renal, in these cases; and that the blood is modified in consequence of general faulty nutrition,—so that it contains matters, which are not present in it in the healthy state. This is confirmed by the fact of the great similarity between the calculous and the gouty diathesis. It is a common and correct observation, that of the children of gouty parents, some may be liable to gout, and others to calculus. Both diseases, too, are accompanied by more or less gastric and intestinal derangement, and by modified nutrition in general; and another striking point of similarity between them is—the presence of the lithate or urate of soda in the concretions that are met with in the joints of those, who have suffered repeated arthritic attacks. Now, the lithic or uric acid was at one time presumed to exist in the urine only; yet, in these gouty cases, it is separated from the blood by other organs than the kidneys; and it is probable, that in calculous cases, the disease may not consist solely in faulty secretion by the kidneys, but that the blood may contain the elements of the calculous deposits in unusual quantity, and not in the same state of admixture as in health. These inferences are essential in a practical point of view, inasmuch as they indicate the importance of attending not only to the condition of the kidneys; but that the state of the whole system should be regarded; and observation exhibits the value of such attention.

The chief sediments, that form in the urine, may be conveniently treated under two heads, according to the two sets of salts that form the main precipitates, each of which has indeed its own diathesis.—*First*, the *lithic* or *uric*, in which the lithic acid and the lithates form the precipitate; and *secondly*,—the *phosphatic*, in which the phosphatic salts are deposited.

a. *Deposits of Lithic Acid and the Lithates.*—Lithourorrhée. (*Piorry.*)

These calculi are by far the most common. Their nature and causes are, consequently, most interesting. They are presumed to be—in two cases in three—the first step in the formation of urinary calculi, wherever formed—in the bladder or in the kidney. (*Willis.*) Lithic acid has, indeed, been estimated to predominate in more than one-third of the whole number of urinary calculi. (*Prout.*)

Urine, containing lithic acid in abundance, may scarcely differ,

when first voided, from the healthy,—from that, at least, which is often passed by those who have no calculous diathesis whatever. Persons, apparently in perfect health, will void urine, which completely encrusts the utensil, and, of course, contains an unusual quantity of lithic acid. The urine is, in those cases, of a higher colour than natural, and is perfectly transparent. The crystals of lithic acid are deposited as the urine cools, adhere to the sides of the vessel, and are deposited loosely and in multitudes at the bottom. It would not appear, that urine, which is depositing lithic acid, is of greater specific gravity than natural. Experiments have shown it to be of the density of 1.018, 1.020, and 1.022. (*Willis.*)

The calculi or crystals of lithic acid are usually of a brown, reddish, or fawn colour; at times, as dark as mahogany or walnut. The crystals seem to be four-sided prisms, resembling sea-sand or Muscovado sugar in appearance, but drier and more gritty. When not distinctly crystallized, the surface is often smooth and irregular; but more frequently, perhaps, tuberculated. Internally, the arrangement appears to be in concentric layers, and they present, when broken, the appearance of imperfect crystallization, or of no crystallization whatever. In the latter case, they have been found to contain lithate of ammonia. When exposed to the heat of the blowpipe, they give off a peculiar animal odour, become black, and gradually consume, leaving a small quantity of white alkaline ashes. They are wholly soluble in caustic potassa, and are precipitated by acids, under the form of a white granular powder. A fragment, put into a watch glass with a little nitric acid, and heated, dissolves with effervescence, and the solution, subjected to evaporation to dryness, leaves a residuum of a beautiful purple colour. (*Guibourt.*)

The crystals of lithic acid are very sparingly soluble in water; and this circumstance has given rise to much difference of sentiment amongst chemists as to the means by which the lithic acid is held dissolved in the urine, in the quantity in which it is often met with.

The explanation of Dr. Prout has appeared to be the most simple, although chemical objections may be urged against it. He is of opinion, that the lithic acid of the urine is, in health, in the form of a soluble lithate of ammonia—a superlithate; and that its deposition from the urine is owing to the presence of a free acid in that fluid, which lays hold of the base; but the point is unsettled, and demands farther investigations.

The following view has been given of the deposits that occur in lithic states of the urine, according to their colour and state of aggregation:—

Red crystalline sediment, composed of	{	Lithic acid and the colouring matter of the urine. The crystals are rhomboidal prisms, which in the field of the microscope appear under the form of pretty regular lozenges, generally of a beautiful topaz-yellow colour singly. (<i>Vigla and Quevenne.</i>)
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Lateritious, red, or reddish-brown sediment, composed of	{ Lithate of ammonia; purpurate of ammonia and soda; colouring matter of the urine; and occasionally an admixture of the earthy phosphates. (<i>Prout.</i>) { Lithic acid, combined with the colouring matter of the urine. (<i>Vigla.</i>)
Yellowish sediment, composed	{ Essentially of lithate of ammonia; a little lithate of soda, colouring matter of the urine; more or less of the earthy phosphates. (<i>Prout.</i>) Of lithic acid, combined with less of the colouring matter of the urine, than in the preceding form of deposit. (<i>Vigla.</i>)
Pink sediment, composed of	{ Lithate of ammonia; purpurate of ammonia. (<i>Prout.</i>) { Lithic acid almost wholly; some lithate of soda; animal matter, and a little phosphate of lime. (<i>Quevenne and Vigla.</i>)

It has been before remarked, that lithic deposits take place in certain conditions of the functions of innervation and circulation; and, likewise, under certain derangements of the digestive operations. They also occur, almost invariably, to a greater or less extent at the termination of febrile paroxysms; and hence the favourable prognosis deduced from the lateritious sediments in such cases; but, independently of febrile disorder, there is a morbid disposition to deposit lithic acid and the lithates. This is what is called the *lithic diathesis*.

Causes.—Age has unquestionably an influence in causing the deposition of lithic acid. In infancy, we observe it, and between 40 and 60; whilst at other ages it is by no means as frequent.

The different forms, in which the lithic acid depositions occur, are said to be remarkably under the influence of age. (*Prout.*) In the earlier periods of life, the tendency is to the deposition of amorphous sediments and crystallized gravel; in middle age, the amorphous concrete mass more commonly occurs, giving occasion to the formation of renal and vesical calculi; and in more advanced life, there is, occasionally, a disposition to the development of numerous small lithic calculi—pisiform concretions—around minute nuclei. Although exceptions to these general laws occur, they are stated by the eminent observer already cited, (*Prout.*) to be of sufficient constancy to allow of the age and constitutional symptoms of a patient being judged of from a simple knowledge of the characters of the lithic deposits passed by him.

It is obvious, that whatever, at any age, occasions an increase or excess in the saline constituents of the urine may favour the deposition. The lithic acid—as has been remarked—is extremely difficult of solution, and the lithate of ammonia—the most insoluble of its salts—requires about 480 parts of water to effect its solution. Should, therefore, the quantity of lithic acid or the lithates be increased from any cause, a deposition must take place. (*T. Thomson, R. Willis.*) The affinity, too, of the lithic acid for the bases with which it is associated, and by which its solubility is somewhat increased, is so slight, that even the weakest of the acids—the car-

bonic, citric, acetic, &c. are powerful enough to dispossess it, and to effect its precipitation in a concrete form. (*Thénard*.)

It is the common opinion of pathologists, that one of the most potent causes of the lithic diathesis is indulgence in large quantities of animal and other varieties of nutritious food. This may be harmless, provided much exercise be taken; but if, along with such indulgence, the patient lives a sedentary life, the chances are more numerous, that he will be affected with the lithic deposits. The muscular system—it has been well observed—(*Magendie, Andral*) is the most rapid in its nutrition, and it consumes the greater part of nutritive substances, when it is often exerted. They, consequently, who exercise their muscles much, require to eat more, and to make greater use of animal or azoted aliments. But if the same quality and quantity of food be taken, when the muscular organs are kept at rest, the latter do not appropriate all the nutritive azoted matter; hence it is in excess in the economy; is directed towards the kidneys, which are esteemed, by some, to be the chief emunctories for the azote; becomes transformed into uric acid, and thus concurs in the formation of gravel or calculus.

The remark, already made, that the lithic acid is readily separated from its bases by any feeble acids, exhibits the mode in which the presence of free acid in the system may give occasion to its deposition, and accounts for the occurrence of the lithic diathesis in early life, when there is a great predominance of acidity, and when the child subsists greatly on milk—a highly azoted fluid.

Animal food not only lays the foundation for the tendency to form a larger quantity of the lithic acid, but to a diminished secretion from the kidneys, (*Magendie, Chossat*;) and the smaller the quantity of the solvent, the less the saline matter that can be held in solution.

Amongst the special causes of the deposition of the lithic acid and the lithates must be reckoned—various drinks that are habitually used. Water, beer, cider, and thin wines, augment the quantity of the urine, and may thus far be serviceable; but the more generous wines and spirituous liquors, as well as tea and coffee, have been considered to diminish the urinary secretion. (*Magendie*.) In this, however, there is doubtless much that is imaginative. Certain spirituous liquors—as gin—have obtained a reputation as diuretics; and, certainly, when they are taken much diluted, they augment the secretion from the kidneys; but it would be difficult to prove that they, as well as tea and coffee, diminish the secretion, whilst beer and cider augment it, and that the former are therefore bad drinks for those of calculous diathesis, whilst the latter are to be recommended. Almost every one, who has suffered under lithuria, must have been impressed, that the very drinks to which the preference is here given are those that seem, with him, to favour the deposition. “If,” says *Magendie*, “a great eater of animal substances drinks much water, light and sparkling wines, &c. the quantity of his urine will be more than sufficient to dissolve the

uric acid formed by the kidneys, and he will be less exposed to an attack of gravel; but if, on the contrary, he drinks little, and does not drink in proportion to the aliment he consumes; or, still more, if he drinks much, but of liquors charged with alcohol,—such as the strong wines of the country, brandy, strong liquors, &c.—his urine will be less abundant, and it will, consequently, dissolve less uric acid; this acid will therefore, have a greater tendency to separate and to form gravel.”

It is proper, however, to remark, that, amongst English writers on the subject of calculous disorders, much difference of sentiment has existed as to the effect induced by beer and cider in their causation; and this difficulty is greatly owing to the singular fact, that the tendency to urinary deposits is much influenced by locality; and that whilst the cases may be rare in one region,—in another, not far from it, they may be extremely common. Thus, in Vienna and Lower Austria, the proportion of calculous cases is 1 in 24,620; whilst on the Ems and at Salzburg, it is 1 in 46,390; in Galitzia, 1 in 227,000; in Moravia, 1 in 52,480; in Bohemia, 1 in 33,790; in the Tyrol, 1 in 70,954; in Styria, 1 in 85,472; in Illyria and the maritime states, 1 in 37,254; in Venice and the eight provinces, 1 in 7,310; in Milan and Lombardy, 1 in 3,022; and in Dalmatia, 1 in 783;—the proportion in the whole population of Austria being about 1 in 15,531. (*Von Wattmann.*)

Everywhere, the same difference as to the ratio of calculous cases is observable. Whilst in the county of Norfolk, England, one case of calculus occurs in every 21,000 of the inhabitants, and ten or twelve operations for stone have been performed annually, and for many successive years, in the Norwich Infirmary—the disease seems to be entirely unknown in the county of Hereford, no patient having been received into the Hereford Infirmary in a period of upwards of forty years, and no record being extant of the operation of lithotomy having ever been performed within the bounds of that county; yet Herefordshire and Devonshire, it must be recollected, are cider-making and cider-drinking counties. (*Robert Willis.*)

Dr. Willis remarks, that particular articles of food or drink have immense influence in producing the state of urine that leads to the deposition of crystalline matters, which consist—in the great majority of instances—of the lithic acid, or an acid very intimately allied with it, namely, the oxalic united with lime as a base; and this, he thinks, is happily elucidated by a fact, which was communicated to him by Dr. Joshua B. Flint, of Louisville. Fifty years ago, according to Dr. Flint, the city of Boston was noted for the frequent occurrence of stone; and there was then no surgeon of any name, who had not been repeatedly called upon to perform the operation for its removal. Calculus is now, however, a very rare disease in Boston. Dr. Flint is said to ascribe this remarkable change to the discontinuance of punch as a beverage. Fifty years

ago, punch—he affirms—was the standard drink of all classes, and on all occasions; but, at present, no one drinks it.

Admitting that punch may be, “of all the compounds taken into the stomach, perhaps the most powerful in producing a state of urine which is followed by the precipitation of the lithic acid and the lithates,” (*R. Willis*,) and that a change approximating, if not equalling, that described by Dr. Willis, has occurred in Boston, it is very questionable whether the change be owing wholly to the cause assigned, and whether agency be not ascribed to diet, which ought to be transferred—in part, at least—to other influences,—such as a better system of clothing and warming; greater protections against atmospheric changes; and mutation of local influences under the increase of population. The difficulty is not diminished by the additional observation of Dr. Willis, that no country in Europe suffered so much from gravelly and calculous complaints, a century ago, as Holland. One lithotomist is reported to have performed the operation for stone at least two thousand times! but, at present, calculus is not a very common complaint in Holland. The change, adds Dr. Willis, is probably owing to the substitution of tea as a universal beverage, for the spirits or spirits and water that used, in former days, to be consumed in large quantities, and by all classes of the community. Yet tea is classed by Magendie with generous wines, spirituous liquors and punch, amongst the agents that diminish the quantity of urine, and are favourable to the development of red gravel!

Again, eminent medical observers in the British navy, (*A. Copland Hutchinson, Sir William Burnett*,) have been struck with the extreme rarity of calculous diseases amongst sea-faring people. Sir William Burnett, having caused the returns of the British naval hospitals, at home and abroad, to be carefully examined from April, 1830 to Nov. 26, 1836, with reference to this question of medical statistics, it was found that the only instance of the kind, recorded, was one of renal calculus in the hospital at Malta. The average number of seamen and marines, voted annually by the British Parliament, during the period mentioned, including 2,000 boys, was 30,000.

It is worthy of remark, as proving still farther the diversity of sentiment in regard to the etiology of calculus, that Mr. Hutchinson, from a very careful examination of all the results of his observations on this matter, advises a very sparing use of vegetables.

Again, the opinion has prevailed almost universally, that the habitual use of limestone water disposes to calculous depositions, yet, it is certain, that the inhabitants of many limestone districts are remarkably exempt from them. In the great valley of Chester county, in Pennsylvania, where limestone abounds in every part of it, a case of stone is of rare occurrence. A respectable physician, who had been in extensive practice there for twenty years, had never seen a case of it. (*T. Harris*, of Philadelphia.)

The disease is so generally attended by some form or other of

dyspepsia, that the views of practitioners as to its causation have been directed to the stomach more than to any other part of the system; but it is very questionable, whether indigestion is more than one of the general disorders of function that accompany calculous depositions.

That the condition of the kidney must not be overlooked by the pathologist is shown by the fact, that injuries of the lumbar region or kidney frequently induce not only phosphatic but lithic depositions. (*H. Earle.*) The fact, that one kidney is most frequently affected, shows that one organ must be more liable to the depositions within it than the other, although we should, perhaps, infer erroneously, were we to say that it certainly secretes more of the lithic deposits than the other. The circumstance, moreover, is explicable upon the view that some accidental cause of detention has arisen in one kidney rather than in the other, which has given occasion to the phenomena of renal calculus in it.

Reference has already been made to hereditary predisposition, which undoubtedly exists in many cases; and is, at times, extremely difficult to obviate. Stress has also been laid on the diminished temperature of the urine, which has been found—as well as that of the whole body—to be less in children and the aged than in the adult, (*Magendie, Chevallier,*)—the diminished temperature impairing the solvent powers of the urine, and therefore favouring depositions; but it is not probable, that this circumstance can have much agency. Copious sweating, and any large serous evacuation, have been presumed to act in the same manner, by diminishing the quantity of the menstruum; yet, a regular perspirable state of the surface is presumed by all to be of great moment in the way of prevention. Indeed, the prevalence of urinary depositions has been referred to extensive and sudden alterations of temperature; and in the case of the county of Norfolk, already mentioned—the prevalence of the cold and damp east wind has been invoked in the causation, (*J. C. Crosse;*) but there must be other circumstances than these; inasmuch as on this continent, there are many situations more unfavourably situate than Norfolk, which are not subject to the malady.

Want of due exercise (*Wilson Philip, Sir B. Brodie,*)—remaining long in bed, and the habit of keeping the urine for a long time in the bladder; bodily fatigue; and, with some, great mental exertion, (*Civiale,*) also communicate a tendency to deposition, where the calculous diathesis exists.

It is obvious, from all that has been said, that the etiology of these depositions is sufficiently obscure.

Treatment.—The prevention and removal of the lithic diathesis reposes mainly on the avoidance of the various exciting causes that have been enumerated.

Under the *vice* in the system of nutrition, it is usually important to make use of revulsion, such as change of diet, and change of air, society and scenery; and, especially if the individual has been accustomed to a sedentary life, to advise regular exercise: warm

clothing, and flannel next the skin are also of especial moment; and diluents should be freely allowed. These are the main points of prevention, which are requisite even when the diathesis has become completely established, and the evidences are visible externally, as well as shown by the internal phenomena. Under these latter circumstances, three indications have been laid down, which embrace the main rules of management. (*Magendie.*) *First*, to diminish the quantity of uric acid formed by the kidneys;—by the avoidance of agents which favour its formation. *Secondly*, To augment the secretion of urine or of the menstruum, by the use of aqueous and slightly diuretic drinks, and *Thirdly*, To saturate the uric acid. This last indication is accomplished by the exhibition of the alkaline carbonates in a state of great dilution. *Magendie* recommends the carbonates with excess of base; but their continued use is apt to injure the lining membrane of the stomach. It is preferable to employ the full carbonates or bicarbonates of the pharmacopœias, which may be taken for weeks and months, without injury. The bicarbonate of soda possesses all the properties of the class, and may be given in doses of 20 or 30 grains, two or three times a day, either alone, or—what is preferable on the score of taste—dissolved in the ordinary soda-water of the shops. By some, it is directed to be given in a thin mucilaginous liquid, (*Robt. Willis,*) but no advantage is obtainable from the mucilage, inasmuch as it is digested in the stomach; and, moreover, its digestion is not always easy, so that it is but little adapted for a pathological condition, in which the digestive function is generally already impaired. It has been suggested, that the alkalies should be given between the meals, otherwise they might destroy the characters of the pepsin, (*Schwann,*) or digestive element. (*Willis.*)

For the dyspepsia, which is almost a universal concomitant of the disease, a combination of alkalies and bitters,¹ or of alkaline earths,² with bitters,³ may be prescribed.

¹ R.—Sodæ, bicarbonat. ʒj.

Infus. calumb. vel gentian. ʒv.

Tinct. calumb. vel gentianæ,
ʒiij.—M.

Dose, a tablespoonful, three times a day
—an hour before each meal.

² R.—Magnes. ʒj.

Infus. gentian. vel calumb. ʒvj.—M.

Dose, the same as the last.

³ R.—Potass. subcarb. ʒj.

Aquæ calcis, Oj.—M.

Dose, a wineglassful, two or three
times a day, with an equal quantity
of new milk.

Where circumstances will allow of it, change of air, by travelling is very important; and if practicable, the change should be to waters in which the alkalies predominate. The waters of Vichy are much celebrated on the continent of Europe; so much so, that they are often prepared artificially.

In this country, the Saratoga waters are an excellent remedy; and not the less so from the slight impregnation of iron, which they contain. It need scarcely be repeated, that no artificial, and

no real, water drunk away from the spring, and, therefore, without the accompanying advantages of travelling air and exercise, can be regarded as substitutes for the water taken at the source.

Artificial Vichy Water.

R.—Sodæ carb. ʒj. gr. lvj.
 Calcii chlorid. gr. xj.
 Sodii chlorid. gr. $\frac{1}{3}$.
 Sodæ sulph. gr. vj.
 Magnes. sulph. gr. vj.
 Ferri sulph. gr. $\frac{1}{3}$.
 Aquæ, ʒxx.
 Gas. acid. carbon., volum. 3½.—M.

b. *Deposits of the Earthy and Alkaline Phosphates.*

Urine, containing these depositions, has been recently termed *Ceramuria*, κεραμύρις, “earth,” ούρον, “urine.” (*R. Willis.*)

The phosphatic depositions may occur either in the form of sand, or they may be amorphous, or crystallized. From numerous observations, (*Prout*,) it would appear, that the lithic acid forms the nucleus of even other varieties of calculi. It would seem, consequently, that the deposition of lithic acid is a primary step in the formation of urinary calculi, and that the phosphatic formation is the result of a gradual transition from the lithic acid to the phosphatic diathesis. In the progress of this transition, the lithic acid deposition is, in the first instance, changed into one of the lithate of ammonia, with a loss of the tinge derived from the colouring matters of the urine. After some time, this last gives place to a sediment, which is chiefly composed of carbonate and phosphate of lime; and this is ultimately succeeded by a deposition of the phosphates of lime and magnesia, in combination with ammonia. From all his inquiries into this matter, Dr. Prout conceives himself warranted in deducing the general *law*, “that in urinary calculi, a decided deposition of the phosphates is never followed by other depositions.”

The calculi of phosphate of lime are usually of a pale brown colour, and of a hardness and polish like porcelain. They are formed of very regular layers, which are usually thick, and easily separable. Their shape is commonly oval, and their size sometimes considerable. They resist the action of the blow-pipe, dissolve readily in muriatic acid without effervescence, and are precipitated from their solution by ammonia.

The calculi of the triple phosphate of magnesia and ammonia—the ammoniaco-magnesian phosphate—are almost always white. Their surface is usually irregular, and covered with small shining crystals; and their texture very imperfectly stratified, or it may be without any lamellated arrangement. They are soft, break readily, and are easily reduced to powder. At times, however, they are hard and compact, and their fractured surfaces present a beautiful crystallization and semi-transparency. It is not common to meet with calculi composed wholly of ammoniaco-magnesian phosphate; whilst it is common to find it associated with the phosphate of lime,

forming the variety of calculus called "the fusible." (*Wollaston.*) In this case, it is white, friable similar to lime; melts with remarkable facility in the flame of the blow-pipe, and dissolves readily in muriatic acid. (*Guibourt.*)

In the healthy urine, the phosphates exist in the state of super-phosphate, when they are soluble; but if any alkali exists in the urine, the excess of acid becomes saturated:—the super-sulphate is converted into the insoluble neutral phosphate, and is deposited. The neutral phosphate of lime is almost insoluble,—not more than half a grain being contained in an ounce of healthy urine, (*Henry*;) phosphate of magnesia requires at least fifty times its weight of water to dissolve it; whilst the phosphate of ammonia is soluble enough of itself, but in combination with the phosphate of magnesia, as it always exists in urine, it is extremely insoluble. A slight excess of phosphoric acid, and—it would appear—the presence of carbonic acid in some cases, render these salts soluble; as super-phosphates and carbo-phosphates, they become very soluble, and are readily evacuated. (*Robt. Willis.*)

The general symptoms which accompany the deposition of the phosphates, or the phosphatic diathesis, are often extremely distressing. Both the *physique* and the *moral* are deeply implicated. Derangement of the digestive organs is a universal concomitant, succeeded by all the symptoms of impaired nutrition. In some cases, in which the bladder has lost a portion of its muscular power, —as in disease of the prostate, affections of the spine, and in the aged—the urine appears to be retained in the bladder long enough to undergo partial decomposition; ammonia is generated; and, as a necessary consequence, the phosphates are deposited. There is generally, along with the constitutional disturbance, more or less pain in the back; the urine is always of a pale colour when voided; and is in larger quantity than in health. At times, it is feebly acid when first passed; but, very frequently, it is neutral, and after the disorder has continued for some time, or is increasing in severity, it never fails to become alkaline. (*Robt. Willis.*) In some cases, it drops incontinently on the clothes; and is, under such circumstances, offensively urinous to the olfactories. Its specific gravity varies greatly according to the period of the day at which it is examined. It has been found as low as 1.004 in the early part of the day; and as high as 1.033 about 11 o'clock at night,—the time when it would appear, by experiment, to possess the highest density.

Causes.—Injuries of a local character have been already referred to as causes of phosphatic depositions. Injuries, of the back and spine especially, have certainly, in many instances, been connected with—and have probably caused—them. It has been affirmed, indeed, that in all cases of spinal irritation, the kidneys secrete an abundance of sabulous matter, (*W. Philip*;) and a large quantity of this deposition has been observed, after concussion of the spinal marrow, floating in a turbid, offensive, and irritating urine. (*T.*

Harris, of Philadelphia.) Dr. Harris refers to a case, recorded in Duncan's Medical Commentaries, of an enormously large calculus, taken from the bladder of a man, who had some years before received a severe injury of his spine.

Independently, however, of these local causes, a general pathological condition of the functions of nutrition always precedes the deposition of the phosphates, so that it has very properly been regarded as the sequence, and complement, as it were, either of some serious general constitutional disorder, or of a state of structural disease, or of great irritation of one or other of the urinary organs, (*Robt. Willis*,) which may, indeed, be itself the cause of the general disturbance of function. "We therefore find it," says Dr. Willis, "occurring amongst the unhealthy, ill-fed, and worse clothed children of poor, ignorant and profligate parents; or otherwise, when the heyday of life is gone, and the system is feeling the effects of an accumulating load of years,—of over-exertion, whether of mind or body, and perchance of excesses committed in early life,—circumstances by each and all of which it is often apparently induced."

Treatment.—So far as regards the use of chemical remedies, it is obvious that they must be of an opposite character to those necessary in the lithic acid depositions. The method of chemical treatment, which has been indicated as appropriate for the lithic acid diathesis, would obviously be injurious in this; accordingly, alkaline remedies must be avoided, and acids—especially the mineral—may be administered with great advantage. They may not only pass into the blood, and be separated from the kidney, but invigorate the digestive apparatus, and prevent fresh deposition. This, after all, is the great object of treatment; and, accordingly, the essential causes must be investigated,—whether general or local,—and, if possible, be removed or combated. If the adoption of a tonic and revulsive system of medication be advisable in the lithic diathesis, how much more must it be demanded here, where the morbid results are so much greater. We must, therefore, inculcate the necessity of a thorough change of all the physical and moral influences surrounding the individual, so as to break in upon the morbid catenation as effectively as possible. With this view, travelling air and exercise must be strongly inculcated, with all their revulsive accompaniments; the condition of the bowels must be attended to, and everything be adopted that can give tone to the general system. Attempts have been made to point out the diet that is best suited for the patient; but, on this subject, not much that is definite can be said. The good effects of change of diet appear, indeed, to be more owing to the change, than to the particular articles administered. It is asserted by one author, (*Robt. Willis*,) that there is no kind of food, which gives such a feeling of renewed strength to a patient, who has suffered from an irritable state of system, and the secretion of urine superabounding in phosphates, as a slice of roast or broiled mutton. This is, doubtless, the

fact; but it does not apply solely to cases of phosphatic deposition. The author, in order to effect revulsion—as far as diet is capable of so doing—has, in many cases, placed the patient on the use of saccharine matter, (syrup. simpl. ℥iss—℥ij. ter die,) given half way between the meals, so that the digestion of the preceding meal may be effected before it is taken. An intelligent medical gentleman, from the interior of the state of Maryland, consulted him some years ago, labouring under a wretched state of health, with copious deposition of the phosphates, which he could invariably correct by saccharine matter taken in this manner.

As the alkaline predominance is here to be apprehended, alkaline effervescing waters must be avoided; but water, charged with carbonic acid,—as in the common mineral waters of the shops—may be employed with advantage. Recently, the lactic acid has been suggested, (*Magendie*,) owing to the facility with which it dissolves the phosphate of lime.

R.—Acid. lact. liquid. ℥j.—℥iv.

Aquæ, ℥ij.

Syrup. ℥ij.—M.

To be taken as a lemonade.

It need scarcely be said, that in order to carry out the principles mentioned above, all the vegetable and mineral tonics may be employed, and especially the chalybeates. The diosma, the uva ursi, and the chimaphila, have been particularly recommended by some; but, apart from their tonic virtues, the author has had no reason whatever to believe that they possess any special properties in those cases.

To allay the irritation—general and local—which is so constant an attendant on this diseased condition, opium may be freely given, either in substance or in any of its preparations. “Under no circumstances,” says a recent writer, “are we more bound to give the beneficent Author of the universe thanks for the virtue he has infused into the poppy, than when we are dealing with the cases that now engage our attention. (*R. Willis*.)

The lithic and the phosphatic are the two main diatheses. Occasionally, however, other calculi are deposited; and, frequently, those already described alternate with each other, so as to form what have been called the “*alternating calculi*,” which require the treatment to be varied according to the character of the deposition at the time prevailing.

c. *Calculous depositions of the Oxalate of Lime, or the Mulberry Calculus.*

Oxalic acid is not one of the constituent principles of healthy urine; so that it is not easy to discover the modification of the blood, or of the urinary secretion, which gives occasion to its formation.

Calculi of the oxalate of lime are commonly of a deep brown or

black colour, similar to that of dried blood. Their surface is rugous, and tuberculated like the fruit of the mulberry, which has given them the name of "mulberry calculi." They are hard and compact, and their texture presents an irregular stratified arrangement; their form is spherical, and size not great. Under the blowpipe, they become covered with a white efflorescence, which reddens turmeric paper. When reduced to powder, they dissolve slowly in the muriatic and the nitric acids, and are precipitated from their solution by ammonia. (*Guibourt.*)

In cases of deposition of the oxalate of lime, nothing but general management can be employed with any great prospect of benefit. No chemical antilithic is available in such cases; and the hopes of the practitioner must be reposed upon modifying the whole system of nutrition in the manner recommended under the other forms. It would appear, that acid aliments favour the precipitation of the oxalates. Two cases are on record, in which it occurred in persons who were accustomed to eat large quantities of sorrel. (*Magendie, Ratier.*) Accordingly, the treatment recommended for the lithic diathesis—the free use of diluents and of the carbonated alkalies—would seem to be appropriate.

It has been suggested, where the oxalates are deposited from the urine, that endeavours should be made to effect a revolution in the nature of the prevailing diathesis, and to change the oxalic diathesis into the lithic. (*Prout.*)

Under the use of muriatic acid, the lithic acid will be deposited abundantly in many cases; but—it has been properly asked—(*Robert Willis,*) are we quite sure, that there is not also oxalic acid elaborated at the same time, and, in consequence of the treatment, by possibility even in greater quantity than before? and if a nucleus be present upon which deposition may take place, the advantages of having the lithic acid substituted for the oxalate of lime are not great enough to compensate for the more rapid growth of calculi when they consist of the lithic acid or the lithates. Dr. Willis thinks, however, that where there has been no deposition, Dr. Prout's idea might be acted upon, especially as there appears to be some testimony in its favour.

In all cases, however, the main endeavour of the practitioner must be to modify the whole system of nutrition by the tonic and revulsive methods already advised.

d. *Calculous depositions of the Cystic Oxide.*

Depositions of the cystic oxide or *Cystine* are extremely rare. They are of a pale yellow colour; have a polished surface, and an appearance of crystallization. They are not formed of distinct layers, but appear like a confused mass. The fragments have a particular brightness, and semi-transparency. When exposed to the fire, they exhale a peculiar fetid and characteristic odour; dissolve equally in acids and alkalies; and their combinations with these bodies are capable of crystallizing. The calculi have not been

analyzed more than four or five times. (*Guibourt.*) The specimens examined are affirmed to have been all remarkably pure; the cystic diathesis appearing to be followed by the lithic, but by no other. It appears to have been most alleviated by a general, tonic and revulsive treatment, and the muriatic acid, with light tonics and anodynes, seem to have answered best. (*R. Willis.*)

e. *Calculous depositions of the Xanthic, Lithic or Uric Oxide.*

These depositions are also unfrequent; not having been found and examined many times. In one case, the calculus was compact, hard, of a lamellated texture, smooth surface, and of a brown colour, similar to that of cinnamon. It fused under the blow-pipe, turned brown, and consumed, leaving a small quantity of white ashes. Subjected to distillation, it furnished a fetid ammoniacal liquor, from which, on cooling, carbonate of ammonia crystallized; and afforded a yellowish oil. Reduced to powder, and boiled in water, it dissolved, and the solution slightly reddened litmus paper. It dissolved in both acids and alkalies, but more readily in the latter. The solution in nitric acid, evaporated to dryness, left a residuum of a bright citron colour, partly soluble in water, to which it yielded its colour. It is insoluble in alcohol and ether; soluble in very small quantity in acetic acid; and soluble, or nearly so, in oxalic acid, bicarbonate of potassa and saturated carbonate of ammonia. (*Marcet, Guibourt.*)

The deposition is so rare as to be regarded only as a matter of curiosity. (*R. Willis.*)

f. *Fibrinous Concretions.*

It is scarcely proper to call these calculi. They have been presumed to be owing to the secretion of albuminous matter under violent irritation of the kidney, (*Guibourt;*) but it is more probable, that they are formed by clots of blood detained in the urinary passages. The fibrinous calculus of *Marcet* resembles yellow wax in colour and consistence; its chemical characters are those of fibrine.

Lastly.—A concretion has been described of late years, (*Hodgkin,*) which consists of a series of concentric layers of white elastic substance, like cheese or coagulated albumen, containing between each layer a thinner one of very friable earthy matter. It can scarcely be considered, perhaps, in any other light than as a fibrinous calculus, with alternate layers, perhaps, of phosphate of lime.

Such are the chief calculous depositions that are met with.

Diagnosis of renal concretions, both when quiescent, and in their progress to the bladder.—Calculi of considerable size, may form in the kidney, and yet not be indicated by any diagnostic symptom. The ordinary symptoms of chronic nephritis may be present, but nothing to indicate the existence of any concretion. At other times, long continued obtuse pain is felt in the region of the kidney; shooting downwards in the course of the ureter, and,

at times, accompanied by numbness in the thigh of the affected side, with painful retraction of the testicle, as in nephritis. These symptoms may be much aggravated, when the patient is exposed to any severe concussions, as by riding on horseback, or in a carriage, over rough roads. Occasionally, too, under such circumstances especially, the urine contains more or less blood; and where the kidney is large, suppuration is generally established sooner or later, and atrophy of the organ results. (*Marcet.*)

When a calculus—even of a very minute size—leaves its situation in the kidney, its course is attended with a series of symptoms, strikingly analogous to the passage of a gall-stone along the biliary ducts. These symptoms are termed, collectively, *Nephralgia calculosa*, *Colica nephritica*, and a *fit of the gravel*. There is no morbid condition, perhaps, in which the suffering is more excruciating. Pain is generally felt in the region of the kidney, or deep in one side of the abdomen. This may not be severe for a time, and may be extremely obscure, so that, by the feelings, it is difficult to say, whether it is seated in the kidney or ureter, or in the intestines. More or less indescribable uneasiness is, likewise, experienced at the part where the ureter enters the bladder. Along with these symptoms, there may, or may not be, more frequent calls to evacuate the bladder; numbness of the thigh; and painful retraction of the testicle. Soon, the pain augments to a degree that is almost insupportable; continues for a time, and then remits,—to return, however, until the calculus ultimately clears the duct, and attains the interior of the bladder.

Associated with the above local symptoms, there may be general disorder. Often, the pulse remains wholly unaffected; but, at other times, there is more or less febrile indisposition. Always, or almost always, nausea and vomiting attend the paroxysm. If the urine be examined, it may be found healthy or high coloured; and it is at times bloody. When the concretion has reached the bladder, it generally induces dull uneasiness in the part of the mucous membrane, with which it is in contact. At times, it passes off by the urethra; but, at others, remains for a day or two, exciting a good deal of uneasiness. It rarely, perhaps, happens, that it is retained in that viscus.

From the above detail of symptoms, it is obvious, that the passage of a renal calculus along the urethra might be readily mistaken for an attack of bilious colic; and such a mistake is by no means uncommon. The pain in both is excruciating; and, although the latter is chiefly on one side of the abdomen, and generally accompanied by more or less retraction of the testicle of the corresponding side, and numbness of the corresponding thigh, the last symptoms—as has been remarked—are at times absent, and it may not be until the pain has evidently subsided, and a small concretion has passed, that the true nature of the affection is understood.

Treatment.—When, from the disordered function of the kidney, with pain in the region of that viscus, and the other symptoms

described above, there is reason to suspect the existence of a calculus in the kidney, the urine must be examined as to the probable character of the deposition, and the particular remedies—alkalies or acids—be given, according as the deposition is lithic or phosphatic. Cups may likewise be applied to the lumbar region, if necessary, or rubefacients,—as in nephritis. It must be borne in mind, however, that immediately before unequivocal evidence is afforded of the deposition of calculous matter within the kidney, the urine, which may have previously deposited freely, ceases to exhibit any sediment as it cools, but in the course of a day or two sabulous particles become perceptible. (*Robt. Willis.*)

In a severe attack of nephritic colic, the object is to allay the spasm, and in this manner to facilitate the progress of the calculus towards the bladder.

Opium may be given freely, so as to induce relaxation, as advised under the head of Gall-stone. Emollient glysters, containing opium, are likewise serviceable, by virtue of their warmth also; and, with the same view, the warm bath may be advised, directing the patient to remain in it for some time. It is rarely necessary to take blood from the general system, but should the symptoms seem to require it, blood-letting may be had recourse to, and opium be given after it. In similar cases, it might be advisable to exhibit nauseating doses of antimonials.

After an attack of gravel, the general functions remain disordered for some time; so that a tonic and alkaline treatment becomes necessary, like that advised under the head of Lithic Depositions from the Urine; and—if practicable—the individual should be directed to travel, in order to enjoy that revulsion, which change of air, society and scenery is capable of affording.

X. INCREASED SECRETION OF URINE.

The quantity of urine, secreted by the kidneys, varies in health, under different circumstances. It is more copious in winter than in summer, and is increased under the operation of certain medicinal agents, called diuretics. Its quantity may, however, be so far and so regularly augmented, as to constitute a state of disease. Sometimes, this augmentation consists in an enormous discharge of watery urine; at others, of urine containing a large quantity of saccharine matter; and although both these conditions have been described under the head of Diabetes, there is advantage in separating them, as they differ much in their pathology.

a. *Increased secretion of Watery Urine.*

SYNON. Hydruria, Hydruresis, Paruria incontinenens aquosa, Hyperuresis aquosa, Diabetes insipidus, D. spurius, Hydrops ad matulam, Urorrhœa, Polyuresis, Diarrhœa urinosa; *Fr.* Diabète insipide, Hypérorrhée, (*Piorry.*) *Ger.* Unschmackhafte Harnruhr, Falsche Harnruhr.

The average quantity of urine, passed in the course of the day, by an adult, may, perhaps, be estimated—as already remarked—at about two pints and a half; but, under particular morbid con-

ditions, of the nervous system chiefly, the quantity may be largely augmented, so as to give rise to the affection termed diabetes insipidus, in which the urine—as the name imports—is tasteless; a quality which distinguishes it from that of diabetes mellitus, which contains a considerable amount of saccharine matter.

Diagnosis.—The affection is characterized by constant desire to evacuate the urine, both by day and night; accompanied, at times, by uneasiness in the region of the kidneys, and by irritation at the neck of the bladder and along the urethra.

Some strange cases are on record, as to the quantity of urine occasionally passed by the kidneys, without disease of those viscera apparently existing. In one case, 42 pints were discharged in a day, and in 93 days, 3674 pints, (*Morgagni*;) in another, 40 pints were passed daily; and, in one day, 52 pints. This case occurred in a man. In another, a young girl, who took only seven pounds of nourishment, 36 pints were voided in the twenty-four hours. (*P. Frank*.) Many such cases are on record, but one of the most singular has been recently cited. (*Robt. Willis*.) It was that of a small artizan, aged 55, who was received into the Hôtel-Dieu, of Paris, to be treated for a bruise on his knee, from which he speedily recovered. His uncommon thirst, and the incessant calls he had to pass his urine, attracted attention, when it was found that, from the age of five years, he had suffered from constant thirst, and been affected with a commensurate diuresis. During the ten days he remained in the Hôtel-Dieu, he consumed, on an average, 33 pounds of water daily, often swallowing above two quarts at a draught. The solid food was about one pound and three-quarters, and he appears, also, to have taken a little wine. His evacuations, daily, were about 34 pounds of urine; and, at the most, one pound of fæces. Yet he looked, and appeared to be, well; possessed the ordinary strength of a small man of 55; was the father of several children, and suffered no inconvenience except from the necessity of drinking, and of voiding his urine so frequently.

The specific gravity of the urine scarcely exceeded that of pure water: when reduced by evaporation, and yeast was added to it, it gave no signs of fermentation. It seemed to be quite healthy, but very much diluted.

This is one form of diabetes insipidus. Another consists in a very copious discharge of urine, containing an excess of urea—*azoturia*. (*Robt. Willis*.) The urine, in this case, is generally pale and without sediment; and it deposits crystals of urea, on the addition of nitric acid, without the aid of concentration. In this form, the symptoms of constitutional disturbance are more marked, in consequence of the formation of an unusual quantity of urea at the expense of the system.

Causes.—A copious secretion of urine is a common accompaniment of the affections to which the epithet “nervous” is usually applied, and, accordingly, of hysteria. The analysis of different observers, (*Cruikshank, Nysten, Peschier*,) have differed mate-

rially; and it is probable, that it commonly varies but little from the state of health. The experiments of a recent inquirer, (*Robt. Willis*,) have led him to infer, that the characteristic ingredients were, generally speaking, not essentially altered in their quality or relative proportions, although he found them in very small amount, when their ratio to the menstruum was considered. He was always able to detect urea; and, if any salt appeared to be more abundant than another, it was the chloride of sodium.

The urine, voided by many nervous subjects in such profusion in the earlier part of the day, he found to be of the same general description as in hysteria. The specific gravity was sometimes found to be as low as 1.002. In the after part of the day, however, when the excitability of the frame had passed away, he has found the urine of the same person of a specific gravity as high as 1.033, and containing such an abundance of urea as to yield a plentiful crop of crystals of nitrate of urea, on the addition of nitric acid, without any preliminary concentration. "On standing, this urine almost always deposits the phosphatic salts; in from twelve to twenty-four hours, it becomes covered, on the surface, with an iridescent pellicle; and, by and by, its reaction is alkaline, although, when voided, it was acid."

As to the pathological character of this affection, it is evidently not an organic disease of the kidney. It is an augmentation of the natural secretion of the organ; and although secretion—as elsewhere remarked—is not perhaps carried on immediately under the nervous agency, it cannot be doubted, that it is often materially influenced thereby; and, perhaps, the suggestion of Dr. Willis is at least an approximation to the truth,—that it is intimately connected with the nervous temperament. All those who have suffered from it, within the sphere of his knowledge, he remarks, were men of mind, possessed of keen sensibilities, and highly impressible nervous systems.

Compared with the augmented secretion of urine containing a quantity of saccharine matter, to be described presently, this affection is comparatively devoid of danger. Even when urea is separated largely, and the system is debilitated thereby, it rarely or never proves fatal, and may be generally brought within the healthy bounds by appropriate management.

Where urea is copiously secreted, the affection is considered to be allied to those morbid conditions, in which the urine contains albumen or sugar, or deposits the phosphates. (*Prout*;) but from what has been already observed, it differs from them essentially.

Treatment.—It is not easy to say what form of remedies is best adapted for the removal of this affection. It would seem clear, however, that agencies, which will direct the flow of fluids towards the cutaneous surface, must be appropriate. Accordingly, warm clothing, with flannel next the skin, the constant use of the flesh brush, and regular exercise, are likely to prove of benefit. Every agent, that adds to the secretory irritation of the kidney, must be

carefully avoided. No saline substances or spirituous solutions must be used; and to allay the excessive thirst, which is generally present, it is better that the patient should take ice frequently, rather than that he should drink even ice-water. If much fluid be taken, the kidneys must necessarily be excited to action, and the morbid condition be thus kept up. When uneasiness is experienced in the region of the kidneys, cupping should be directed to the loins; and an intermittent irritation, induced by the ointment of tartarized antimony or by croton oil, may be established in the same region. Opiates have been strongly recommended, (*Robert Willis*;) and good effects may be induced by the use of tonics, especially of such as are at the same time astringent. The tincture of the muriate of iron, (ten to thirty drops, three or four times a day, in water,) is a good preparation for this purpose.

b. *Increased secretion of urine containing saccharine matter.*

SYNON. Diabetes, D. mellitus, D. verus, Melituria, Phthisuria; *Fr.* Diabète sucré, Hypérurhée saccharine, (*Piorry*); *Ger.* Honigartige Harnruhr.

Diagnosis.—The diagnosis of this disease does not present any great difficulty. Its principal characters are—a far more copious secretion of urine than natural, which contains a considerable quantity of sugar obtained at the expense of the system; and, therefore, gives occasion to marasmus and death, in the large majority of cases.

Diabetes may come on suddenly, or in a progressive manner. The copious evacuation of urine may be preceded by pain in the loins, and in the course of the urinary passages. The quantity greatly exceeds that of the fluids and solids taken, however considerable their amount may be. Frequently, fifteen or twenty pints are passed in the course of the 24 hours; and there are cases, in which forty or fifty, and even two hundred pints, [?] have been voided. (*Roche* and *Sanson*.) There is some reason to believe, that in certain cases, a superabundance of dense urine, loaded to excess with urea, may precede the secretion of saccharine urine (*Prout*.) The urine in diabetes mellitus is generally pale, colourless, or of a yellowish citron hue; inodorous, sweetish, and even saccharine. It has been generally said to contain no azote, and to be devoid of both urea and uric acid. It would appear, however, that urea is generally contained in it in larger relative proportion than in healthy urine, but that it is masked by the presence of sugar, and cannot be discovered by the addition of nitric acid, except by peculiar management. By distilling the residue of a given measure of diabetic urine at a temperature a little above that of boiling water, at which the urea is decomposed, it was ascertained, from the quantity of carbonate of ammonia evolved, that urea was present in considerable proportion, (*Henry*;) and by treating the residue of diabetic urine with dilute nitric acid in a flask, and plunging this into a freezing mixture, the average quantity of nitrate of urea was obtained. (*Kane*, *Robert Willis*.)

The saccharine matter, contained in diabetic urine, is susceptible of fermentation, and is convertible into alcohol and acetic acid. When it becomes sour, it smells like milk that has turned. The addition of a little yeast, especially if the urine has been previously concentrated by evaporation, causes it to undergo the vinous fermentation. When evaporated to the consistence of syrup, and treated with animal charcoal, &c. it affords a crop of crystals, of a sweet substance, which differs not from that obtained from the must of the grape, or from fecula by the action of dilute sulphuric acid. There, also, remains a considerable quantity of sweet uncrystallizable syrup, analogous, in its nature, to molasses.

The calls to void the urine are very frequent—four or five times or more during the night; and it is not unusually passed involuntarily.

The quantity of sugar varies in different individuals, and in the same individual at different times. In two cases, which fell under the author's observation, the amount of dry extract, obtained, was as much, at times, as $\frac{3}{4}$ ss. to the pint. The average quantity is generally, however, less than this.

Although passed in such great quantity, diabetic urine is always of considerable specific gravity, ranging between 1020 and 1050, and even 1055; and this obviously dependent greatly on the quantity of saccharine matter, which it holds in solution. (*Robert Willis.*)

The disease is attended generally with voracious appetite, and unquenchable thirst. The skin is dry and harsh; the tongue clammy, and often furred or red, and there is a secretion of thick, viscid saliva. As the disease proceeds, there is an odour from the body, like that of hay. This odour is exhaled strikingly from the lungs.

It is interesting to remark, as connected with the pathology of this disease, that sugar is not formed alone in the kidneys. It has been found in the saliva of a diabetic patient, which fermented briskly when yeast was admitted to it, (*Mr. M. Gregor*;) and complaints are frequently made of a constant sweet mawkish taste in the mouth, and a feeling as if the teeth were set on edge.

Notwithstanding the quantity of solid and liquid ingesta, usually taken, the system suffers under the excessive secretion of solid and liquid matters, by the kidneys especially. All exertion becomes irksome, and it has been observed, that sexual desire ceases. "It is curious to know," says a recent writer, (*Robert Willis*), "that in one of the few cases of recovery (and I use the word guardedly) from the disease that I am acquainted with, the only function that remained in abeyance was the sexual." The temper and disposition always suffer materially, the patient being restless and dissatisfied with everything around him; the intellectual and moral faculties become daily more and more obtunded; the sleep is incessantly interrupted by desire to drink or to pass the urine; the functions of the stomach are disordered, so that the patient suffers constantly from eructations, borborygmi, sense of weight at the

epigastrium, alternate diarrhœa and constipation, &c. &c. Emaciation makes greater and greater progress; the limbs become œdematous; and all the symptoms of hectic fever present themselves, under which the individual ultimately sinks to death.

The duration of this disease is extremely various. Sometimes it proves fatal in a few months; at others, it persists for years. It is very rarely cured; and under such circumstances it is a happiness that the disease is rare.

Causes.—These are not evident. It appears to attack males more frequently than females, and generally occurs about the middle period of life, although it has been met with both earlier and later. We have not sufficient evidence to pronounce, that any particular constitution or habit of life favours its occurrence. It certainly does not present itself more frequently in the intemperate; for, were it so, it ought to be common in this country, whereas it is extremely rare; yet it has been ascribed by most authors to the abuse of wine and spirituous liquors; and, indeed, by one writer, to the excessive use of tea, which has been regarded as an excitant drink! (*Dezeiméris.*)

It would appear, that an organization derived from progenitors, offers a decided predisposition. The disease has been distinctly traced through several successive generations. It does not follow, however, that the children of one who has died of diabetes shall necessarily be attacked by it. As in other cases, of hereditary predisposition, the malady may be warded off by a careful attention in avoiding the exciting causes. Dr. Robt. Willis knows a family of eight persons, not any member of which has ever shown the slightest tendency to urinary derangement, although the father died of diabetes in its most aggravated shape.

Like most diseases, diabetes has been ascribed to cold; and some have assigned great agency to constant atmospheric humidity. Hence, it has been said to prevail to a greater extent in Holland and England, than in many other countries, but this is not established; indeed, it has been positively denied on good authority. (*Dezeiméris.*) It certainly would seem to be a more common disease in Great Britain than in this country. In the Royal Infirmary of Edinburgh, it was affirmed, by Dr. Home, during the author's attendance there, that cases of diabetes are in the wards during every medical session; and Dr. B. C. Babington informed Dr. Robt. Willis, that on occasion of preparing to keep an *act* at Cambridge, during his college life, his father, who was then in very full practice in London, had found him opportunities for seeing as many as twenty-three cases at one time, in every one of which, the saccharine state of the urine was ascertained.

In the annual report of the interments for the city and county of New York, for the year 1839, two cases of diabetes are reported as occurring in males,—one in a person between 30 and 40 years of age, and the other in one between 70 and 80. In the report for Philadelphia, during the same year, there is no case recorded.

It is not easy, however, for us to admit, that damp cold can have anything more than a collateral agency, when we are told, that the disease occurs in intertropical countries, (*Christie*;) and is almost unknown in Russia. (*Robt. Willis*.)

It is manifest, that the causes of diabetes are obscure; and that, thus far, we are enabled to appreciate very imperfectly, the conditions that give rise to it.

Pathological characters.—The attention of observers was naturally directed to the kidneys in diabetes; and in fatal cases we still look to the condition of those organs in the obscurity of the subject, although there is great reason for the belief, that they are not as much concerned as has been generally believed. No appearance has been observed in them, that can be regarded as uniform. Perhaps the most common has been hypertrophy, (*Andral*,) although some have mentioned a condition of paleness and anæmia: but this is rarely observed. Andral, indeed, affirms, that amongst the observations relative to the dissection of those who have died of diabetes in the last ten years, there is none, to his knowledge, in which the kidneys presented an anæmic appearance.

The lesions, that have been met with elsewhere than in the kidneys, have been by no means pathognomonic. Occasionally, the great nervous centres have presented morbid appearances, doubtless of an accidental character. Some have affirmed, that the chylopoietic viscera have been found in a state of hyperæmia. In other cases, the stomach has been found larger than usual; and the mucous membrane thickened, and highly injected. That viscus and the upper part of the bowels have been generally distended with a large quantity of greenish coloured fluid possessing unusual acidity. The large intestines have been commonly impacted with pale greenish-coloured dry fæces or scybala, not possessing the proper excrementitious odour. The functions of the liver appear to have been always more or less deranged, the bile having been found to possess an acid, instead of its natural alkaline, reaction; to be of a very pale yellowish colour, and peculiarly fluid; and, in two-thirds of the cases, the disease has been terminated by tuberculosis of the lungs; and, lastly, the body of the patient who has died of diabetes has been observed not to exhale the usual cadaverous smell, and even when laid open, the serous cavities have emitted none of the peculiar and characteristic odour. (*Robt. Willis*.)

In a case, which the author observed with much interest, the appearances on dissection afforded no satisfactory evidence as to the nature of the affection. There was adhesion of the lungs to the pleura costalis, but these did not appear to be recent; they are, however, by no means uncommon in diabetic patients. No morbid appearances were observed in the kidneys, although they were particularly examined, excepting an enlargement of the infundibula and ureters; nor was there any evidence of disease about the chylopoietic organs.

Under these circumstances it must be difficult to pronounce as

to what is the nature or proximate cause of diabetes mellitus. The increased quantity of urine, and the presence of a large quantity of saccharine matter in it are prominent symptoms, which would appear to fix the disease in the organs that secrete the urine; but the augmented secretion of urine is partly accounted for by the unusual quantity of fluid, taken to relieve the thirst, which is excessive. The cause of the presence of sugar has been sought for in the condition of the blood, which was affirmed long ago (*Cullen, Dobson,*) to contain saccharine matter. Chemists, however, of eminence, (*Marcet, Thénard, Wollaston, Henry, Bostock, &c.*) have failed in detecting it. The negative evidence was suffered by many pathologists to prevail, although it had been observed, that the fluid of transpiration was sweet, which could not possibly have happened unless the blood had contained saccharine matter, or the elements from which it could be formed. Of late, however, respectable chemists have boldly asserted, that they have unequivocally discovered it in the blood. (*Ambrosiani, Maitland, M'Gregor, Müller, Medebach.*) To obtain the diabetic sugar, the serum was coagulated by Mr. M'Gregor, and carefully dried by heat. The solid mass, being divided as minutely as possible by a pair of scissors, was boiled in water, and the decoction having been filtered through paper, was evaporated to a certain extent. The concentrated liquid on the addition of yeast fermented strongly for several hours.

Not satisfied with these results, and desirous of tracing the presence of saccharine matter still farther back, Mr. M'Gregor instituted several experiments, from which he is led to infer, that the stomach, in diabetes, forms a preternatural proportion of sugar, and that the admission of the saccharine matter into the chyloferous vessels, and the consequent presence of a material in the blood, which is foreign to its healthy composition, is the cause of the different morbid phenomena of diabetes;—the kidney merely separating—as the great depuratory organ—the foreign material conveyed to it from the blood.

The experiments, however, of Mr. M'Gregor, require confirmation. If we grant, that the stomach forms an inordinate quantity of sugar from the blood, it is not easy to see how it escapes the action of the stomach and of the chyloferous vessels, which appear to reduce all alimentary matters to their elements, and to recombine them so as always to form the same fluid—chyle—from the heterogeneous materials subjected to them. (See the author's *Human Physiology*, 4th edit. vol. 2. Philad. 1841.) The disease must exist, likewise, in those vessels of selection. The author is, indeed, disposed to refer it to the whole system of nutrition; saccharine matter being formed not only by the chyloferous vessels, but by the lymphatics, in every part of the economy, at the expense of the system; so that emaciation supervenes, if not wholly, in part, from this cause, rather than from the irritation produced by the saccharine matter itself on the system of nutrition.

Treatment.—In the obscurity of the precise pathology of diabetes, the treatment has been obscure also, and has varied according to the particular views embraced by the therapist. Where the disease has been considered to be seated essentially in the kidney, remedies have been directed to that organ; and where the mischief has been referred to the stomach, that viscus has been the chief object of attention. “Could we discover”—says a recent writer, (*Robt. Willis*,)—“any means of preventing the stomach from forming sugar, we should, I believe, succeed in curing the disease.” With the views which the author embraces, he cannot believe, that the stomach is the main organ to which attention should be directed. The disease—as before remarked—appears to him to be seated in the whole system of nutrition; and, therefore, remedies that are addressed to the whole system, and which are adapted for modifying the function of assimilation generally, appear to be clearly indicated. Frequently, there is a feverish condition of the frame, which is benefited by blood-letting; and, under its employment, the quantity of saccharine matter in the urine—as might have been imagined *à priori*—has been diminished. Opium has had the same effect, and has been largely administered, to the extent, indeed, of inducing narcosis,—and, in one case, which the author had an opportunity of witnessing, a question arose, whether the fatal result were immediately owing to the disease or to the remedy, or to both combined. Where this valuable therapeutical agent appears to be indicated, it may be given as in other morbid conditions; but there is no reason for believing, that it exerts any special beneficial agency in diabetes. With the author’s view, revellents would appear to be most clearly indicated. Occasional emetics and cathartics, the use of warm clothing,—as of flannel next the skin,—and the warm bath, a thorough mutation of the diet, with travelling air and exercise, will break in upon the disease, if any agents are capable of so doing.

Almost all therapists have advised, that the patient should be restricted to animal diet, under which—it has been affirmed—the proportion of saccharine matter in the urine has diminished. It is reasonable, indeed, to suppose, that vegetable food, consisting only of the three elements—oxygen, hydrogen and carbon—which enter into the constitution of sugar, should be more readily converted into sugar than animal food, which consists of four elements—oxygen, hydrogen, carbon and azote; but on the other hand, a like diminution in the quantity of the saccharine matter has been perceived, when the patient, after having been accustomed to a mixed diet, has been restricted to vegetables; the benefit, in both cases, being probably more dependent upon change than upon the particular diet to which the patient has been subjected.

It is not necessary—indeed, it would be an idle waste of time—to enumerate the various articles of the *materia medica*, that have been administered empirically in diabetes mellitus; some on reasons which have weight, but others on no solid foundation. Thus, it

has been suggested, that "from the effects of acetate of lead, in restraining active hemorrhage, and other discharges, it may be found useful in diabetes, and is, therefore, worthy of trial," (*Mackintosh*;) and, in like manner, the employment of various other astringents, as alum, tannin and creasote, have been advised. It need scarcely be said, however, that no identity exists between active hemorrhage and the disease under consideration; and, consequently, that the agents in question have been advised on a false analogy. So far as they are capable of entering the mass of blood and modifying the condition of that fluid, and, through it, of the system of nutrition, they may be serviceable; but their agency in this respect is limited; and they are, in reality, entitled to but little confidence. Three cases have been recently published, in which the tincture of muriate of iron, according to the following formula, is said to have been found beneficial. (*C. Clay*.)

R.—Tinct. opii, ℥iss.

— ferri muriat. ℥ij.

Quiniæ sulphat. gr. viij.

Aquæ destillat. ℥vj.—M.

Dose, an ounce, three times a day.

c. *Increased secretion of Milky Urine.*

SYNON. Diabetes chylosus, D. lactea, Chyluria, Galacturia, Pyuria lactea, P. chylosa, Cœliaca urinalis, C. renalis, Chylorrhœa urinalis, Ch. renalis, Fluxus cœliacus per renes; *Fr.* Diabète chyleux; *Ger.* Milchharnen.

A milky appearance of the urine is occasionally observed, without there being any evidence of renal or vesical mischief. Formerly, it was universally believed to be owing to chyle being discharged with the urine; and the researches of a distinguished modern chemist have shown, that it contains principles analogous, if not identical, with those of the chyle; hence its name, "chylous urine," and "chylo-serous urine." (*Prout*.) The urine is generally copious; but, at times, the quantity is not greater than natural, and it generally varies from 1010 to 1020. After it has been discharged for a short time, it sometimes coagulates into a gelatinous body, like *blanc-manger*, and, afterwards, gradually separates into a clear, yellowish fluid, and a white clot; at other times, a white flaky matter is deposited, without general coagulation of the mass; and, at others, again, a white homogeneous substance rises to the surface, like cream. The matter, which separates in all these shapes, appears to approach fibrine or caseine in its characters, and to bear a resemblance to the white coagulum of chyle. (*Prout, Christison*.)

The urea is always found to be very defective, but is never altogether wanting.

The peculiarities of this kind of urine are said to be best marked a few hours after a meal: and they are apt to be removed temporarily by inflammatory action, or by ptyalism from mercurials.

The causes of this condition of the urine are by no means apparent. It has been met with in both sexes, and at all ages; and a

considerable proportion of the cases is said to have occurred in persons who had been a good deal in hot climates. It does not appear to be always accompanied by derangement of health; but, at times, the general symptoms strongly resemble those of diabetes mellitus.

In regard to the nature of the affection, nothing decisive is known. The excellent chemical pathologist, already cited, (*Prout*), who has had an opportunity of seeing more or less of thirteen cases, is led to suppose, "that the chyle from some derangement in the process of assimilation is not raised to the blood standard; and, consequently, being unfit for the purposes, is, agreeably to a law of the economy, ejected through the kidneys; but these organs, instead of disorganizing or reducing it to the crystallized state as usual, (that is to say, instead of changing it into lithate of ammonia,) permit it to pass through them unchanged." "That this is a just view of the matter"—he adds—"cannot, I think, be doubted; for if the chyle was properly converted into blood, not chyle but blood ought to be thrown off by the kidneys."

It has not been established, however, that the blood is chylous, which ought to be the case, were the presence of chyle in the blood the cause of the appearances in the urine; and it is remarked as not a little strange, that although blood has been drawn several times in the disease, no one has hitherto taken any notice of its appearance or properties. (*Christison*.)

Where a fatal termination has taken place in the course of this affection, death has arisen from some acute internal inflammation; and no morbid appearance whatever has been discoverable in the kidneys.

Treatment.—It is difficult to suggest any philosophical mode of meeting the disease. Should evidences of excitement present themselves, they must be reduced by appropriate antiphlogistics. Counter-irritation, by means of a seton, has done some good at the first; but the system has speedily become accustomed to it. (*Prout*.) It is a consolation, however, that the constitutional disturbance—as before remarked—is often exceedingly slight, or null; and that a person may be affected with it for years, without the system appearing to suffer. (*Prout*.) In such cases, it ought not to be interfered with; especially as we know of no rational means for removing it. (*Christison*.)

XI. SUPPRESSION OF URINE.

SYNON. Paruria inops, Paruria retentionis renalis, Anuria, Ischuria notha seu spuria (of some), Suppressio urinæ, Ischuria renalis; *Fr.* Suppression d'urine; *Ger.* Harnverhaltung.

Dr. Good has given the name Paruria inops to "destitution of urine, without desire to make water or sense of fulness in any part of the urinary track;" and Paruria retentionis renalis to stoppage of urine, accompanied by "pain and sense of weight in the region of the kidneys, without any swelling in the hypogastrium." In

the former case, the urine is not secreted by the kidney; in the latter, it is secreted, but does not from some cause descend the ureters. The former is the *Ischuria notha seu spuria*, *Suppressio urinæ*, of many authors; the latter, the *Ischuria vera* or *Ischuria renalis*, of many. It is chiefly to the former, or suppression of urine from want of secretion by the kidneys, that attention will be directed here.

Diagnosis.—The urine is known to be suppressed, by the absence of the fluid in the bladder, when the catheter is introduced, or of any evidences of distension of that organ, or of a desire to pass the urine. Generally, it is a most alarming symptom, and commonly presents itself in the worst forms of certain diseases, as cholera spasmodica, in which it indicates the complete morbid change that has taken place in most important functions. Yet, although the suppression of this depuratory secretion is generally of fatal import, cases are on record in which it has persisted for several days, and yet the person has recovered; nay, there are some in which it has been arrested for weeks, (*Parr, Haller;*) and the case of a youth of 17 years of age is recorded, who had never passed urine in his life. (*Richardson.*) This, however, was owing to malformation; and it is not improbable, as has been suggested, that the ureters terminated in the intestinal canal, so that the urine and fæces were passed together as in birds and the monotremata. (*Robert Willis.*)

It has been affirmed, too hastily, by a distinguished physiologist, (*Adelon,*) that the secretion of urine cannot be arrested for three days without death resulting. In addition, however, to the cases already given, and others that might be brought forward, allusion may be made to one published somewhat recently, (*Döring,*) in which death did not take place until the expiration of twelve days, during all which time there was no secretion, renal or vicarious. Not long ago, the author had under his care a young gentleman, labouring under melancholia, characterized by all the resistance to ordinary influences, which belongs to that form of insanity, in whom the urine had certainly not been discharged for ten days; yet the quantity, ultimately voided, was by no means large, so that the daily secretion from the kidneys must have been greatly diminished, if not arrested.

When the functions of the kidneys are not exercised for a length of time, other portions of the economy—it has been affirmed—may take upon them the depuratory office, and large quantities of urinous fluid may be discharged by vomiting, or by the cutaneous exhalents. Experiments on animals have exhibited, that when the kidneys are extirpated, urea—the matter of urine—the *Harnstoff* of the Germans—can be detected in the blood. It is not astonishing, then, that a urinous character should be given to many of the secretions, which are necessarily derived from the blood. It can be understood, too, that the presence of matters in the blood, which ought to have been thrown off from the economy in the process of

depuration, may act most injuriously upon the vital organs, and we can thus comprehend how the functions of the brain may be interfered with, and how coma may be produced by the presence of urea, as it is by that of bile, in the blood. In such cases, an unusual quantity of serous secretion has been found within the cranium, in which the odour of urine was distinctly perceptible. Frequently, a decided urinous taste has been perceived by the patient; and the cutaneous transpiration has been markedly urinous.

Although ischuria is occasionally symptomatic of serious and fatal disturbance of the general functions, it may arise as a local disorder of the functions of the kidney. It is then said to be characterized, along with the symptoms before enumerated, by dull pain or sense of weight in the lumbar and iliac regions, with great anxiety, nausea, vomiting, hiccup, cramps, general irritability and restlessness, and sometimes delirium, lethargy, and coma; these symptoms, however, are accompaniments, whether the suppression begins in the kidney or is symptomatic of general disorder.

Very frequently, a partial secretion is effected, and it has been remarked, that a very small amount of urinary depuration is sufficient for the wants of the system, whilst the total cessation of the secretion for any length of time is almost uniformly fatal. (*Sir H. Hallford.*)

Causes.—These are not always clear. Like other diseases, and in the obscurity of the subject, it has been referred to exposure to cold. It may certainly be induced by mechanical injuries, either external, or from causes within the body. Thus, it is known to have been induced by calculous irritation of the kidneys. When one kidney is affected; the other may still accomplish the secretion; but it is apt to assume the same kind of irritation sympathetically; and, in this way, the secretion may be arrested from both simultaneously.

It has been suggested, that suppression of urine may supervene upon blennorrhœa when the discharge has been suddenly checked, (*Abercrombie;*) but the occurrence must be rare. It would appear, too, to have been witnessed as secondary to some intestinal or cerebral disease.

Pathological characters.—These have been various. Usually, perhaps, the kidneys have presented evidences of inflammatory action. They have been of a redder colour than natural; and, at times, their substance has been drier and firmer than in the healthy state. Where the suppression has been dependent upon calculous deposits, they will of course be found in some part of the kidneys.

Still, the morbid appearances throw no light on the nature of the disease. It is an abolition of the secreting power of the kidneys, but how induced we know not.

Treatment.—In our ignorance of the pathology of this affection, it is impossible to lay down any precise method of treatment. Should there be any evidences of nephritis, the appropriate management, inculcated elsewhere, must be had recourse to. Cupping,

especially—combining, as it does, both depletion and revulsion—should be prescribed, and repeated according to circumstances.

If this plan of treatment be generally right, it is difficult to see how the stimulating diuretics can be generally beneficial, as they cannot fail to irritate organs, whose vital manifestations are probably already exalted. It has been advised to apply a succession of large blisters on either side of the fleshy mass constituting the sacro-lumbales muscles. (*Robt. Willis.*) Cathartics with the warm bath may likewise be recommended, and the free use of diluents. Such would seem to be a rational mode of treatment, and accordingly it will be found the most successful.

Usually, the routinist, who looks only to the deficiency or total absence of the secretion, has recourse to his excitant diuretics,—as cantharides, which have, indeed, been esteemed a kind of specific in ischuria. It need scarcely be said, that they should be used with much caution, and never where there is reason to presume the existence of nephritis. The same may be said of the terebinthines which have been highly extolled. (*Elliotson.*)

Narcotics, as opium and tobacco, have been administered in some cases, and it is said with benefit, (*Geo. Gregory,*) but it is idle to attempt to lay down precise rules, where—after all—so much must be left to the discretion of the physician.

It has been properly remarked, that when the urine has become nearly suppressed, in long continued organic disease of the kidneys, no remedial measures will restore its quantity; and if once coma has fairly set in, the case is all but hopeless. (*Christison.*)

SECTION II.

DISEASES OF THE URETER.

THE excretory duct of the kidney is not liable to many diseases; and, therefore, it will not be necessary to say much in this place. It may be attacked by inflammation—*Ureteritis*—and the symptoms may be somewhat equivocal. Usually, along with the ordinary evidences of internal inflammation, there is deep-seated pain on pressing on the course of the ureter: these symptoms may or not be accompanied by great irritability of the bladder, of a symptomatic character; and similar to that, which is so common a concomitant of renal disease. In a case, which the author attended not long ago, the pain was referred chiefly to one groin,—spreading, however, towards the linea alba; and there was a somewhat diffused, hard tumefaction, which was very tender on the slightest pressure being exerted. Under leeching and poulticing, the excessive tenderness gradually diminished, and, in about ten days or a

fortnight from the commencement of the attack, pus was copiously discharged along with the urine. In this case, there was much obscurity of diagnosis;—no uneasiness was felt in the region of the bladder; and the author was rather disposed to suspect the existence of typhloenteritis. The result proved, that the ureter was the seat of the disease. The patient wholly recovered.

The author has met with three or four cases of the same character, in which equal obscurity existed in the diagnosis; but where the weight of evidence was in favour of the presence of inflammation of the ureter.

Inflammation of the ureter may supervene from common causes, like inflammation of other internal organs; but the most probable cause is calculous or other depositions lodging in the channel, and obstructing or irritating it.

Where any substance is arrested in the ureters, the duct above the obstructed portion sometimes becomes very largely distended: both the ureters have, indeed, been observed as large as the small intestines. (*Sir Benj. Brodie.*) It is obvious, too, that any tumour pressing upon the ureter, may lead to the same result. In these cases, the parietes of the ureter become occasionally extremely attenuated. On the other hand, any source of irritation in those ducts may lead to modification of nutrition and to stricture of the duct, owing to morbid depositions in its parietes.

During pregnancy, severe pain is occasionally felt in the course of the ureters, leading up to the kidney, which has been attributed to *spasm of the ureters*. (*J. Burns.*) It has been suggested as probable, that it arises from pressure upon the ureters as they pass into the pelvis, and that the same effect may possibly arise from a dyspeptic state of the stomach. (*Churchill.*)

The attack is purely local, consisting of severe, and sometimes intermitting pain, with distressing strangury, which may cause abortion, if not relieved. (*J. Burns.*) The most appropriate treatment consists in the revulsion produced by purgatives, followed by full opiates. The pain is also removed, at times, by change of posture.

SECTION III.

DISEASES OF THE URINARY BLADDER.

I. INFLAMMATION OF THE BLADDER.

SYNON. Cystitis, Empresma Cystitis, Inflammatio vesicæ, Cystiphlogia, Cystitis urica, Uro-Cystitis; *Fr.* Cystite, Inflammation de la vessie; *Ger.* Harnblasenentzündung, Entzündung der Harnblase.

Inflammation may attack the peritoneal coat of the bladder, or it may affect the mucous coat more especially. In either case, the disease may extend to the muscular coat, so that all may become implicated. Commonly, however, the inflammation is seated in the mucous coat, mainly; and, as in inflammation of the mucous membranes in general, after the disease has existed for some time, the secretion of mucus which had been arrested at the commencement of the inflammation, becomes augmented in quantity and modified in quality; so that the disease, especially in the chronic form, has—from this symptom—taken the names—*Cystorrhœa*, *Catarrhus vesicæ*, *Paruria stillatitia mucosa*, *Dysuria mucosa*, *Pyuria mucosa*, *Catarrhal inflammation of the bladder*; *Fr.* *Cystite muqueuse*, *Catarrhe de la vessie*, *Flux muqueux de la vessie*; *Ger.* *Blasenkatarrh*, *Blennorrhœe der Harnwege*.

Diagnosis.—The general symptoms of inflammation of the bladder are the following:—more or less pain is first experienced in the hypogastrium, immediately above and behind the os pubis, which is augmented by pressure, moving the body, the contraction of the abdominal muscles, coughing, sneezing, defecation, and by efforts to pass the urine. More or less tension and tumefaction is generally also perceptible in the hypogastric and perineal regions. The patient suffers from perpetual calls to pass the urine, and the effort is always extremely painful and ineffectual,—a few drops only flowing, with great suffering. The smallest drop passes with a sensation of burning heat; and, not unfrequently, the efforts are wholly ineffectual. This perpetual desire has been termed, by some, *Tenesmus vesicæ*. Under these circumstances, the bladder becomes gradually distended; the tumour above the pubis is manifest, and extremely painful to the touch; and the pain extends to the kidneys, perineum, rectum, and, indeed, over the whole abdomen.

During the first days, the urine which is passed does not present any unusual appearance. The first effect of inflammation on a mucous membrane being to diminish or arrest the secretion, no mucus is perceptible in the urine; but, subsequently, the urine generally presents a modified colour, is troubled and reddish, and deposits, on cooling, a quantity of glairy and ropy mucus, similar

to white of egg, which can be readily elevated through the fluid upon a rod of twigs, or on the feather of a quill.

When the disease is but slight, there may be no marked signs of general irritation, and the symptoms gradually yield; but when the inflammation is to a greater degree, or, if the other coats of the bladder are implicated, there is always more or less heat and dryness of skin, and other symptoms of pyrexia,—as dryness of the mouth, nausea, vomiting, frequency and hardness of the pulse, which becomes afterwards small and contracted. In certain cases—it is affirmed—instead of dryness of the skin, copious sweats supervene, which have a urinous odour.

Cystitis may terminate by resolution or by suppuration. In the latter case, pus may form in the parietes of the organ, and break into the cavity of the pelvis, causing fatal peritonitis; or it may penetrate the rectum, uterus, or intestines. The most fortunate termination, is by communication with the interior of the bladder. In certain cases, the pus, which is discharged with the urine, would appear to be the product of the inflammation of the mucous coat. The termination by gangrene is extremely rare.

When acute cystitis is succeeded by the chronic form, the signs of activity of circulation, and the heat and tension of the hypogastric and perineal regions diminish; the calls to evacuate the bladder, and the pain and heat during its passage, are much less urgent; but the characteristic appearances of mucus in the urine are more or less abundant. When a catheter has been introduced into the bladder under such circumstances, great difficulty has been experienced, and intense suffering. In certain cases, the urine exhales an insupportable odour.

Chronic cystitis may endure for a considerable period, but it very generally terminates in marasmus and death.

Causes.—The causes of cystitis are not always clear; as in other cases of internal inflammation, cold has been invoked; but, more commonly, it has been ascribed to mechanical or chemical irritants, affecting the bladder directly or indirectly. When the bladder generally is inflamed, this may be owing to penetrating wounds of the organ, the operation of lithotomy, the long and painful use of the catheter, falls and blows on the hypogastrium; or to a laborious parturition, in which the bladder has been long and severely pressed against the pubis by the head of the child, or injured by the instruments of the obstetrician. Internal irritants—as stimulating diuretics, and especially cantharides, may likewise induce it; and it is affirmed to have supervened on the suppression of an habitual hemorrhage, an old issue, and after the retropulsion of gout or some cutaneous exanthem. (*Andral*.) It would seem, likewise, to have been induced by sympathy of continuity or contiguity in the progress of inflammation primarily affecting the peritoneum, uterus, rectum or urethra. Of the extension by continuity, frequent examples occur in cases of blennorrhœa.

Calculi in the bladder more frequently, perhaps, give rise to

cystitis of the mucous coat, but they may induce inflammation of all the coats of the viscus. This occurs, occasionally, where large or numerous calculi exist in the bladder, and the patient has been compelled to ride a considerable distance over rough roads, or in a carriage badly suspended.

Inflammation of the mucous coat of the bladder may attack all ages, but it has been more commonly met with in elderly individuals, in whom, and, indeed, in all cases, it is favoured by stricture of the urethra, and by every obstacle to the free discharge of the urine.

A form of cystitis has been described, (*Prout*), in which the inflammation assumes the latent character in gouty individuals, and which is consequent upon an attack of irregular gout. It is preceded by rigors, followed by febrile exacerbations, which gradually increase in severity, until, at length, irritative fever, of the most formidable kind, is established, attended with extreme prostration, oppressive nausea and vomiting, but, for a long time, without any urinary complaints. At length, retention of urine occurs to a greater or less extent, and the external organs become tumid, after which the patient rapidly sinks. The urine does not appear to deviate from the normal condition. (*Christison*.)

Pathological characters.—When the substance of the bladder has been inflamed for a short time only, and has terminated by resolution, there may be no trace of the previous inflammation. When it has been chronic, the parietes of the bladder have been found thickened, and, in some cases, where the disease has persisted for a long time, the mucous membrane has been generally thickened, and the muscular coat everywhere hypertrophied. Where the disease has terminated in suppuration, traces of the abscess may be found separating the fibres of the muscular coat from each other, and greatly thickening it; or pus may be found collected into an abscess, or poured into the cavity of the peritoneum or elsewhere. False membranes, free or adherent, may be seen on the mucous coat of the bladder, and it is their expulsion by the urethra which has given rise to the idea, that the mucous membrane may be entirely detached and expelled with the urine.

The hypertrophy of the muscular coat is sometimes so great that it is an inch thick. Under such circumstances, it is of a red colour, although it may be at the same time infiltrated with pus, as it was in one of three recorded cases, in which this remarkable state of hypertrophy was perceived. (*Velpeau*.) In other cases, the coats of the bladder are found to be thinner than usual; to be pale, and to have lost their consistence,—a change which is most frequently observed in the mucous coat. (*Andral*.)

Where the inflammation has affected chiefly the mucous coat, more or less redness may be perceptible, confined to particular parts or diffused over its whole surface. Where the disease has been chronic, the organ is usually diminished in size, and contracted; but at times it is distended with fetid urine, mixed with blood or

purulent matter; its parietes are thickened; the internal surface is of a reddish brown colour, and a network of vessels is often seen developed, similar to varicose veins, and particularly resembling the venous plexus that surrounds its neck. (*Martinet.*) When the bladder is much contracted, it is generally greatly furrowed; the mucous follicles are developed; and, when they are pressed between the fingers, a mucous fluid oozes out similar to that deposited by the urine. Ulcerations of the mucous membrane are likewise frequent, and, in such case more pus than mucus is found in it.

Treatment.—In the acute and active forms of cystitis, powerful antiphlogistics must be prescribed. Bleeding from the arm, to diminish the amount of stimulus in the vessels, must be had recourse to, and be repeated should the symptoms demand it; even when doubts may exist as to the propriety of bleeding from the general system, it may be advisable to apply leeches over the hypogastric region; and after they have fallen off, a large emollient poultice may be placed over the leech-bites. The patient should also be kept, for some time, in the warm bath, and especially in the warm hip bath; and a bladder half filled with hot water, or fomentations may be applied to the region of the bladder. With similar views, warm emollient injections may be repeatedly thrown into the rectum, and, if the pain be very great, the tinctura opii, (gtt. l—lxxx,) may be added to the enema. At the same time, the patient should be kept on the use of demulcent or diluent drinks, in small quantity only; and remain in bed, and in the horizontal posture.

It is a common opinion, that the catheter should be introduced as soon as possible. It has, indeed, been esteemed a principal remedy; and to be serviceable, not only by drawing off perhaps a large collection of water, thereby relieving distension, but sometimes by removing a small quantity of acrid, high coloured urine, by which the patient's sufferings are immediately mitigated. (*Mackintosh.*) It has been a matter of dispute, however, whether it is better to leave the catheter in the bladder, or to introduce it afresh, when occasion arises. The best method, perhaps, is to retain the instrument in its place, when it does not occasion any aggravation of the symptoms, or if great pain and irritation be produced by the introduction. On the other hand, if the urethra is unaffected and of considerable diameter, and the obstacle appears to be seated altogether in the neck or orifice of the bladder, the instrument need not be kept in.

It is hardly necessary, however, to say, that whenever the catheter can be dispensed with, it ought to be,—as under the most favourable circumstances, it can scarcely fail to aggravate a surface already highly inflamed.

The same plan of treatment as is adopted for general cystitis is equally applicable to the catarrhal form when it is acute. It is the

chronic form, however, which most frequently, perhaps, falls under our attention, and requires a modified plan of treatment.

The same difference, indeed, exists between the therapeutics of the acute and the chronic varieties, as between these different conditions of other mucous membranes. In all cases, the causes of the cystitis must be closely inquired into; and if the disease appears to be connected with stricture of the urethra, calculous concretions of the bladder, &c., the patient must be subjected to a treatment adapted to such cases. Where no such manifest cause exists, the main management should consist in revulsion. Bleeding from the arm can be rarely required, but cupping over the perinæum and hypogastric region, repeated according to circumstances, will be found to afford decided relief.

The warm bath, and especially the warm hip bath, and fomentations and emollient injections—as advised under the acute form—will also be highly advantageous in this. Amongst the revelents that have been extolled in this disease, are blisters to the loins or sacrum, or the upper part of the thighs or hypogastrium,—or the ointment of tartarized antimony to the same parts. (*Ferrus.*) A seton has likewise been inserted in the hypogastric region with excellent effects. (*Roux.*)

Under this treatment, assisted by the use of demulcent food, and gentle laxatives, as castor oil; by warm clothing, and mental and corporeal quiet, the disease generally becomes greatly ameliorated; a state of blennorrhœa or gleet may remain, however, after all manifest signs of inflammation have passed away, and—as in other cases of chronic inflammation of mucous membranes—may demand an opposite plan of treatment from that which is indicated in the more inflammatory period. Under such circumstances, the various mineral and vegetable tonics have been freely given. The cinchona, colomba, and gentian have been most commonly employed, and they are capable of fulfilling all the objects with which the articles of the class are administered.

Of the astringents, some have been supposed to act more particularly on the urinary organs. Of these, the most prominent are the diosma and the uva ursi. The author has frequently administered these agents, but he has had no reason to believe, that they exert any special agency on the urinary organs. They are tonic astringents, and, as such, may be beneficial.

R.—Diosm., seu Uvæ ursi fol. ℥ss.

Aquæ, Oss.—M.

Dose, two or three tablespoonfuls, three times a day.

The copaiba, the cubebs, and the turpentine have likewise been advised, and it is said with benefit. The copaiba and turpentine may be given in the form of pills, or of emulsion; and the cubebs in electuary.

R.—Cubeb. pulv. ℥ss.

Mellis despum. q. s.—M.

Dose, a teaspoonful, three or four times a day.

The turpentine, with the catheter kept constantly in the bladder, comprised the treatment usually advised by Dupuytren at one time. (*R. Willis.*)

Of the mineral excitants and astringents, the preparations of iron are perhaps the best when given internally. Of these, the *tinctura ferri muriatis*, (gtt. x. ter die ex aquâ,) the *liquor ferri persesquinitratis*, (gtt. x. ter die, ex decoct. hordei,) and the *ferri iodidum*,¹ are to be preferred.

¹ R.—*Ferri iodid.* gr. xxiv.

Aquæ destillat. ʒj.—M.

Dose, a teaspoonful, three times a day.

Where the disease is manifestly connected with an atonic condition of the parietes of the bladder, the catheter or *sonde à demeure* becomes indispensable; through this injections may be sent, so as to come in contact with the seat of the disease. These may be emollient or astringent, as the pathological condition may seem to demand.

Injections of tar-water, along with the internal use of turpentine, have been strongly recommended on high authority. (*Dupuytren.*) The tar-water was made, by infusing in the cold, for a night, a pound of tar in ten pounds of spring water, filtering and warming the solution before using it. Large quantities of this were injected through an elastic gum catheter, which was forthwith withdrawn, and the patient directed to retain the injection as long as possible. It was repeated daily. Venice turpentine was given internally in the form of pill.¹ The iodide of iron would make an excellent injection in such cases.²

¹ R.—*Terebinth. venet.*

Pulv. glycyrrhiz. āā, ʒss.—

M. et divide in pilulas xxiv.

Two to be taken three times a day.

² R.—*Ferri iodid.* ʒj.

Aquæ, Oij.—M.

Of late, it has been proposed (*Lallemand*) to cauterize the interior of the bladder in the following manner. Professor Lallemand takes a large catheter of pure silver,—for if there be any alloy the caustic acts upon it,—which is open at both ends, and has two kinds of stilet, according to the part which it is desired to cauterize. At the extremity of the stilet, is a small excavation, containing the solid nitrate of silver, which is first pulverized, and then placed in the excavation over a spirit lamp; this fuses and moulds it to the cavity. When the instrument is prepared, an ordinary catheter is introduced into the bladder, in order to empty it completely. This precaution is necessary, as the urine would dissolve the caustic, and prevent it from directly affecting the mucous membrane. When this has been withdrawn, the instrument bearing the caustic is to be introduced closed; and the moment it has entered the bladder, the stilet must be pushed, and the *porte-caustique* be rapidly turned from side to side, two or three times; the stilet must then be pulled into the instrument, and withdrawn,—the object being to touch the surface in as many points as possible. Whilst the

instrument is within, the bladder contracts and grasps it, and the kidneys secrete a small quantity of urine. This small quantity of fluid, however, is advantageous, as it acts as a vehicle to the portion which it does not decompose, and conveys it equally over the surface of the membrane. At the moment, the patient usually feels a sharp pain at the neck of the bladder and in the rectum, described as not unlike a pinch, but much more supportable than the continued dull pain of chronic catarrh. There is now an irresistible desire to pass the urine; and, as the bladder is nearly empty, very little passes, and this causes a burning sensation along the urethra, and is accompanied by some drops of blood. This desire is renewed every moment, causing violent but useless efforts. These gradually decrease; and on the second or third day, there is no longer any pain in making water, and a few small gray eschars, like burned paper, come away with the urine. In the majority of cases, it is said, one cauterization is sufficient for a cure. M. Lallemand affirms, that he has never found a fourth application of the caustic required.

A recent writer, (*O'Bryen*,) affirms, that the advantages of this mode of practice are very great, when cases, suited for it, are selected. It is always inadmissible, when the kidneys or prostate are diseased.

Injections of soot have likewise been employed with great advantage. Two ounces of compact wood-soot were taken from the chimney, broken, washed, and boiled in a pound of water. The decoction was filtered through paper, and injected into the bladder twice a day. In six recorded cases, (*André Gibrin*,) the good effects supervened closely on the administration of the remedy; the pain ceased, and the patients obtained sleep, to which they had been, for some time, strangers. The urine gradually became clear, and recovered its natural appearance.

Testimony has been given by others in regard to injections of soot in this disease, (*Gigouin*;) but some do not speak in an equally favourable manner in regard to it. Soot is necessarily very variable in its character, and, therefore, must be uncertain in its action. At times, indeed, it would appear to have given rise to great increase of irritation in the inflamed membrane. (*Civiale*.)

II. IRRITABILITY OF THE BLADDER.

SYNON. Cysterethismus, Irritabilitas vesicæ.

Irritability of the bladder is occasionally a most distressing affection, and one which is by no means easy of removal. It is often, too, symptomatic of diseases of other parts, and requires, consequently, great care in the diagnosis, or rather in the etiology.

Diagnosis.—There is generally pain in the region of the bladder, which shoots in various directions to the back, anus, thighs, and along the urethra. This is commonly aggravated by the presence of urine in the bladder, so that the patient is often called upon several times in the course of the night, and more frequently, per-

haps, throughout the day, to evacuate the urine, which he does with great pain and difficulty,—*Dysury*; Ger. *Schwerharnen*—and drop by drop,—*Strangury*; Ger. *Harnzwang*. Where the disease is idiopathic, and consists in impressibility of the nerves of the organ, constituting *Neuralgia of the bladder*, the urine may not, at first, present any appearance different from the healthy condition; but as some degree of inflammation is apt to be induced sooner or later in the lining membrane, it may present constituents that are foreign to it,—such as an unusual quantity of mucus or pus. The irritation, too, may be extended to the kidney, and a copious precipitate be thrown down, which may consist of one or other of the calculous depositions before mentioned; or a granular condition of the kidney may be developed. On the other hand, as elsewhere shown, this last pathological condition may give occasion to the affection now under consideration.

Under the constant irritation, kept up by this impressibility of the bladder, the general health always suffers; the appetite becomes diminished, the spirits are depressed, and all the functions carried on in disorder; so that nutrition is impaired, and more or less emaciation is the consequence.

At times, but rarely, acute pain and sense of constriction are experienced in the region of the bladder, stretching occasionally forwards to the urethra; with globular contraction of the bladder, retention of urine, frequent urgent calls to evacuate the rectum, often attended with protrusion of the bowel; excessive anxiety, restlessness, and clammy perspiration, but without fever or tenderness on pressing on the hypogastrium. This is the affection known under the name—*spasm of the bladder*, *spasmus vesicæ*, *cystospasmus*, *ischuria spasmodica*; Fr. *Spasme de la vessie*; Ger. *Blasenkrampf*. It may occur at any age, but is most frequently seen in old people, and requires the vigorous employment of narcotics for its removal.

If not arrested by appropriate measures, it may terminate fatally with the usual symptoms of suppression of urine. (*Christison*.)

Causes.—The causes of irritability of the bladder are numerous. It may unquestionably be induced by unusual impressibility, or by a neuropathic condition of the viscus, as well as by chronic inflammation of the parietes of the bladder; but it is most commonly developed by irritation seated elsewhere. The believers in the doctrine of spinal irritation would refer it, occasionally, to a morbid condition of the part of the spinal marrow with which the nerves of the bladder are connected. Of this pathological condition, we have, however, no sufficient evidence. It appears, indeed, to be more commonly owing to irritation either in the bladder or some other organ, which is conveyed to the spinal marrow and reflected upon the nerves of the bladder. It is unquestionably, also, a common symptom of renal disease. (*Abernethy*, *H. C. Johnson*, and the author.) It has been suggested, (*Robert Willis*.) that the influence of this kind of sympathy in leading to errors in diagnosis has been exaggerated. The author thinks not; and the very fact

of the patient's being called out of bed to pass his urine more frequently than in health has led him, in many cases, to inquire into the condition of the secreting organ,—by examining the state of the urine and the different functional phenomena of the kidneys, which have proved to be the primary source of the vesical disorder.

The first impression, on the part of the practitioner, when great irritability of the bladder exists, is, that the organ contains some extraneous body; the catheter is, consequently, introduced at the expense, frequently, of excessive suffering. The affection is, doubtless, often caused by the presence of calculus in that viscus. It may, also, be induced by disease of the prostate; by calculi in the kidney or ureter; by the use of irritating articles of diet; by stimulating diuretics,—as turpentine and cantharides, either taken internally, or absorbed from a blistered surface; by the introduction of bougies, &c. &c. It is sometimes, also, caused by the pregnant condition, and by the pressure of the foetal head during parturition, as well as by prolapsus uteri.

Treatment.—After what has been said of the various causes that may occasion irritability of the bladder, it is obvious, that the first step towards the treatment is to appreciate those accurately, and to attack the primary affection where this is practicable. It need scarcely be said, that every article of diet or medicine, which may induce irritation, should be carefully avoided; and, consequently, all high-seasoned food, and every therapeutical agent, which we know to be absorbed into the circulation, and to pass off by the kidneys.

Demulcent drinks, and feculaceous aliments, with a moderate proportion of unsalted animal food; the hip-bath; the occasional application of cups, with the scarificator, to the lumbar or sacral region, or of leeches to the perinæum; the use of gentle laxatives, as castor oil, (ʒi.—ʒiij.); of emollient, and starch and laudanum, glysters; and of opiates to allay irritation, constitutes the essential treatment. Here, again, the uva ursi and the diosma crenata have been advised, but the observations already made on those tonic astringents are equally applicable to their employment in the affection under consideration.

In the irritability of bladder of the female, the author has found great advantage from a maintenance of the recumbent posture; the adoption of the general treatment just indicated, and the application of a solution of the nitrate of silver to the meatus urinarius.

Rx.—Argent. nitrat. gr. vj.
Aquæ, ʒj.—M.

It has also been recommended to throw injections into the bladder—as of warm water, flaxseed tea, weak mucilage of gum arabic, &c. Generally, these injections are at first retained but for a short period, and are, at times, suddenly and forcibly returned; but, by a perseverance in their use, once or twice a day, along with the plan recommended above, and the use of revellents, as of the oint-

ment of tartarized antimony to the lumbar or sacral region, the power of retention becomes gradually greater, and recovery is ultimately effected. At times, indeed, revulsion appears to effect a cure, when all therapeutical agents have been employed in vain. This is strikingly the case in married females, who become pregnant whilst suffering under this malady. The erethism, induced in the uterine organs, detracts from that seated in the bladder, and the disease disappears, never, perhaps, to return,—as the period of utero-gestation is sufficiently long to break in permanently upon the morbid impressibility of the vesical nerves.

Where the neuralgic condition has been of long continuance, it may be occasionally removed by a rigid persistence in the plan of treatment advised under Neuralgia.

To prevent the strangury or spasm of the bladder,—Cystospasmus, Ischuria spasmodica,—induced by blisters, it is but necessary, as remarked under another head, to cover the blister with tissue-paper, which prevents the absorption of the cantharidine, and not to permit the blistering ointment to remain on so long that the cuticle may be broken, and the cantharides come into immediate contact with the denuded skin. Some have advised, in the way of prevention, that the surface of the blister should be covered with the tinctura camphoræ; and a modern writer (*Professor Morton*, of Philadelphia,) affirms, that since he has adopted the plan of mixing camphor and opium with the blistering ointment, he has never met with a severe case of strangury, and very rarely with even a partial one. To a blister, five or six inches square, he directs twelve grains of the former, and four of the latter, to be rubbed up with the ceratum cantharidis, before spreading.

The preventive plan, recommended by the author, has, however, proved effectual in every instance in which he has employed it. When strangury has actually supervened, the use of warm diluents,—or demulcent drinks, which, in reality, act simply as diluents,—with hot fomentations applied to the hypogastrium or perinæum, or both, are generally successful in affording full relief.

III. RETENTION OF URINE.

SYNON. Retentio urinæ, Paruria Retentionis vesicalis, Ischuria vesicalis; *Fr.* Rétention d'Urine; *Ger.* Harnverhaltung.

The term retention of urine may, with propriety, be restricted to inability to pass the urine from the bladder. An obstruction to the flow of urine may, indeed, exist in the ureter or urethra, but these are rare cases, and need not interfere with the general definition.

Diagnosis.—The patient, on attempting to pass the contents of the bladder, finds that he is unable to do so; he repeats his efforts until he is fatigued, but finds them to be fruitless. At the same time, pain exists in the hypogastrium, which extends to the lumbar region and to the thighs. The pain above the os pubis is increased by pressure, and the desire to pass the urine is rendered by it more urgent. The bladder, except in the extremely corpulent,

and even in them, can generally be felt above the pubis, in the form of a large ball, and yields a dull sound on percussion. Sometimes, it reaches as high as the umbilicus; and, at times, it has acquired such dimensions, in the more chronic forms of the disease, that the patient has been supposed to be affected with ascites, and it has even been proposed to tap him. (*Robt. Willis.*)

Along with the local symptoms, the general system usually exhibits its participation in the morbid influences, and there is more or less febrile disorder, thirst, and occasionally severe headache, with marked anxiety of countenance.

The great source of danger in retention of urine is supposed to be—the bursting of the bladder; but more apprehension ought to be entertained of peritonitis. The bladder is capable of containing a very large quantity of fluid under such circumstances, and instances are on record, where 16 pints and upwards have been evacuated. A case is recorded of a woman, in whom the urine—during a second attack of retention—escaped at the umbilicus, in consequence of the fundus of the bladder having become attached by adhesive inflammation to the peritoneum corresponding to the umbilicus, and ulceration having taken place through it. Four years previous to this attack, the woman had experienced retention of urine for four days before she was relieved by the catheter, when 16 pints were evacuated. From the strength of the adhesion between the fundus of the bladder and the umbilicus, it appeared that the adhesion must have taken place at that period. (*Mackintosh.*)

Causes.—Retention of urine may be caused by a mechanical obstacle seated about the neck of the bladder, or in the course of the urethra. It may, likewise, be owing to inflammation of the mucous membrane at the neck of the bladder, and to a spasmodic contraction of the muscles, which act as sphincters. Paralysis or want of expulsive power may produce the same result. This may be induced by over-distension of the bladder. In old persons, the condition is not uncommon; and it is often produced in them—as has been suggested, (*Rostan*,)—by the wear and tear of the organism: the nervous system, in the aged, becomes obtunded; as indicated by diminution of sensibility and contractility, hardness of hearing; defective vision; general tremors, and by visible changes in the colour, consistence and size of the encephalon and nerves. (*Rostan.*) Retention of urine is, however, only one of the signs of paralysis of the bladder; incontinence of urine and cystirrhœa may likewise be induced by it. When the paralysis affects the neck of the bladder, and not the body, the latter may contract,—and the former being relaxed, there is incontinence of urine; on the contrary, if the sphincter be unimpaired, and the body paralyzed, there may be retention of urine. Loss of power, on the part of the muscular coat of the bladder, may, likewise, be dependent upon spinal mischief, from mechanical or from organic lesions.

A recent writer, (*L. A. Mercier*,) who has inquired carefully

into the causes of retention and incontinence of urine in old persons, has arrived at the following conclusions:—*First*, excepting the cases in which there is disease of the brain or spinal marrow, or general prostration of the whole economy, incontinence and retention of urine in old people depend, almost exclusively, on hypertrophy of the prostate. *Secondly*, The more equally and regularly the hypertrophy invades the prostate in all parts, the greater will be the disposition to incontinence of urine. *Thirdly*, The more partial and irregular the hypertrophy, the greater the disposition to retention of urine; and, *lastly*, in conditions intermediate between the two preceding, *regorgement* of urine is most commonly seen. By the term *regorgement*, M. Mercier means:—when the bladder has attained a certain degree of distension, and the urine flows *guttatim* and constantly, without the organ augmenting or diminishing in any sensible manner.

Retention of urine occurs in the female under two chief circumstances;—in the early months of uterogestation in cases of retroversion and anteversion; and, after delivery, owing to the pressure of the child's head upon the urethra and neck of the bladder. In the former case, the withdrawal of the urine from the bladder is an essential part of the treatment; and, in the latter, the operation is equally necessary; but the author has never met with a case, after delivery, where no serious injury had been inflicted, in which the bladder did not resume its functions in the course of a few days.

Pathological characters.—These must, of course, vary according to the cause of the retention; but, often, the bladder may present no unusual appearances, or it may exhibit increased capacity, caused by constant over-distension.

Treatment.—This must vary according to the pathological condition, which gives rise to the retention. If any mechanical obstacle to the passage of the urine be seated either at the neck of the bladder or in the course of the urethra, it may be necessary to pass the catheter; or if, owing to stricture or other causes, this be impracticable, the surgeon may be called upon either to force the passage, —as has been advised by many of the French surgeons—or to puncture the bladder, either above the pubis or from the rectum.

Should the retention be owing to inflammatory congestion about the neck of the bladder, it may be advisable, especially if the patient be robust, to draw blood from the general system; and the operation may be followed up by the application of leeches to the perinæum; with the general warm bath, or the semicupium, and a full dose of an opiate. Should these means not succeed, the bougie or the catheter may be introduced; but it is well to postpone them, until the other means have failed; and, at the same time, not to permit the retention to continue so long as to run the risk of serious mischief.

Where the retention is owing to loss of power on the part of the muscular coat of the bladder, the catheter should always be introduced early. It has been a question here, again, whether it

should be reintroduced once or twice in the twenty-four hours, or be retained in the bladder,—plugged, so that the urine can be passed every now and then. There can be no question, that if the instrument be passed with great pain and difficulty, it had better be left in; unless, indeed, its continued presence should excite too much irritation.

The uva ursi and the diosma crenata have been advised in these cases—as, indeed, in almost all affections of the urinary organs,—no matter how different they may have been pathologically; but, as elsewhere remarked, they are mere tonico-astringents, and unworthy of much reliance. The same may be said of substances, which act on the urinary organs as diuretics. Any increase of the urinary secretion cannot fail to do harm, whilst the vesical retention exists; and, therefore, cantharides, advised by some (*Robt. Willis*), are objectionable. The author has found decided advantage from the application of a blister to the sacrum, dressed endermically with strychnia, (gr. ss.—ij, manè noctèque.)

A recent writer (*Allier fils*), from having observed—as he believed—contraction of the fibres of the bladder under the administration of secale cornutum, has recommended it strongly in cases of retention of urine; and feels himself justified in inferring, from the results of varied observation, that it is capable of restoring to the bladder the contractility it may have lost owing to immoderate distension of its coats by urine;—that its action has been evinced in cases in which this kind of paralysis has resisted known therapeutical agents; and that, owing to the fugacious character of its operation, it ought to be administered at short intervals, in broken doses, and these long continued.

R.—Secal. cornut. ℥j.—divide in partes vj. æquales.

One, every three hours. The quantity may be raised to 40 grains in the day, and be discontinued by degrees after the cure, to consolidate it.

It may be remarked, by the way, that the noise of water poured from one vessel into another, occasions, at times, the bladder to contract. This, it has been properly suggested, (*Mackintosh*), can only be effected—it is to be presumed—when the retention is induced by a spasmodic affection near the neck of the bladder, or by a general paralysis of the fibres of the organ. The author knew it to be entirely successful in one case, in which a tumour had been extirpated from the lining membrane of the rectum, and retention followed the operation. If the use of the catheter can be obviated by so simple an expedient, it is well that it should be tried.

During the retention, and subsequently, the patient ought not to drink fluids freely, and whenever a desire arises to evacuate the bladder, it ought to be instantaneously obeyed.

IV. INCONTINENCE OF URINE.

SYNON. Paruria Incontinens, Incontinentia Urinæ, Enuresis, Hyperuresis, Mictio inopportuna, Uracratia, Excretio Urinæ involuntaria, Mictio involuntaria; *Fr.* Incontinence d'Urine; *Ger.* Unwillkürlicher Harnfluss, unwillkürlicher Abgang des Urins, Unvermögen den Urin zu halten.

A want of power to retain the urine, or, rather, an involuntary discharge of urine, is a common phenomenon in diseases affecting sensation; but, in such case, it is altogether symptomatic, and its consideration belongs to other heads. It is not unfrequently, however, a morbid condition dependent upon the state of the bladder itself, and to be combated by remedies directed to that organ. It is met with in children prior to the age of puberty especially, and often during sleep alone, and, like retention, it may be an evidence of paralysis of the bladder. This can be readily understood. When the bladder has experienced a certain degree of distension, the urine, subsequently sent into it, is slowly discharged, or dribbles away through the urethra, so that a superficial observer might be deceived, and overlook the distension or regorgement of the bladder, which precedes and accompanies the incontinence. This is the form often met with in the aged; and as it is subordinate to the retention, it can only be remedied by removing the original derangement, and restoring the tone of the bladder, so as to enable it to evacuate its contents. (*Robt. Willis.*) This—it need scarcely be said—is by no means an easy task, where the powers of the bladder have become impaired by the progress of life.

Under Retention of urine, it was remarked, that incontinence is apt to occur in the aged, when the prostate is hypertrophied equally and regularly in all parts. (*L. A. Mercier.*)

Incontinence of urine occurs, occasionally, from injury to the spinal marrow and the nerves proceeding from it; and hence, it is a common phenomenon in paraplegia. In some of these cases, we have paralysis of the bladder, and retention accompanying the incontinence; but in other cases, there seems to be unusual impressibility of the nerves of the bladder, so that the contact of a small portion of urine may be sufficient to excite the muscular coat to contraction.

At other times, again, foreign substances,—as gravel or sand,—irritate the nerves, when not unusually impressible, and give occasion to the like results.

It can be readily understood, too, that mechanical pressure by the foetal head, during parturition, may lead to the same result.

In children, nocturnal incontinence is a frequent occurrence, and one that gives occasion to much annoyance to both child and parent. It almost always disappears in the course of a few years,—usually long prior to the period of puberty; but, at times, persists even afterwards. “In this kind of incontinence,”—it has been remarked, (*Robt. Willis.*)—“the urinary secretion and excretion are invariably and alike deranged; not only are the calls to make water more frequent and pressing than in health, but the urine is

always more copious and of lower specific gravity than is proper; it very rarely contains the due proportion of characteristic animal ingredients, but is colourless and watery." "The disease, therefore, does not depend"—he adds—"on the higher irritability which has been held the appanage of early life; such irritability would not attach to the detrusor fibres of the bladder only, but to those of the sphincters also, by which the balance would be maintained; it is, in fact, generally associated with derangement in the secreting faculty of the kidney, which must be corrected, in order that the evil may be removed." This is plausible; but it is proper to state, that the author has had no reason for believing that the secretion and excretion are "invariably and alike diseased."

Irritation in the vicinity of the bladder,—as in the rectum and in the vagina of females,—may likewise be the cause of incontinence.

Treatment.—The management of incontinence of urine must vary materially, according to the cause. If it is found to arise from paralysis of the muscular coat of the bladder, an examination must be made to discover, whether there be a tumour above the pubis, or any other signs of retention; and if such exist, the treatment, advised under the head of Retention of urine, will be appropriate.

If the nerves of the bladder have lost their power, owing to disease within the spinal sheath, the treatment must be directed to modify the primary affection. With this view, powerful revellents,—as the moxa, successive blisters—or the actual cautery applied on each side of the spinous processes of the lumbar vertebræ—or blisters, dressed afterwards endermically with strychnia, (gr. $\frac{1}{4}$,—gr. ss.), night and morning, hold out the best expectations of relief. The treatment is, indeed, identical with that required in retention of urine from loss of tone in the muscular coat of the bladder. Cantharides have been especially prescribed.¹ The internal use of the nux vomica or strychnia,² has likewise proved serviceable.

¹ R.—Tinct. cantharid. gtt. x. ter die: or,

R.—Pulv. cantharid. gr. $\frac{3}{4}$ —gr. j.

Ext. gentian. seu

Ext. hyoscyam. gr. iij. f. pil. ter die sumenda.

² R.—Ext. alcohol. nucis vomicæ, gr. j.—iij. f. pil. ter die sumend: or,

R.—Strychniæ, gr. j.

Ext. gent. gr. xxx. Divide in pil. xii.

Dose, one, three times a day.

Where the incontinence is owing to an acrid condition of the urine, or to irritating substances of a mechanical nature contained in it, diluents may be freely allowed. It is the custom, in such cases, to prescribe demulcents, as gum arabic water, slippery elm or linseed tea, &c. &c.; but—as elsewhere remarked—they probably act only as so much simple fluid, the mucilaginous portion being digested, and the aqueous alone passing into the blood-vessels, to be separated by the kidneys.

It need scarcely be said, that if calculous depositions are the source of irritation or inflammation about the neck of the bladder, a treatment appropriate to gravel and to cystitis is demanded. The

use of injections of plain water into the bladder has been recommended;—the water being blood-warm at first, and, as the irritability diminishes, the temperature being gradually lowered to that of the atmosphere. From four to six ounces can be borne at first, but the quantity must be thrown in slowly, and the operator should cease, if the patient complains of any uneasiness, or the slightest impediment exists; otherwise the organ will be excited to spasmodic action. If the patient can retain the fluid, it may be permitted to remain, and be discharged in the usual way; but if it cause uneasiness, it should be allowed to pass through the tube. If pain be produced, the operation will do more harm than good; but if it be borne well, it may be repeated from once a week to once daily. (*Lendrick.*)

Incontinence of urine in children is the source of much anxiety to parents, as well as to the sufferers themselves. The author has seen many cases, and his experience has been similar to that of a modern writer, (*Professor Morton*, of Philadelphia,) in regard to the good effects of waking the child at stated intervals, for the purpose of evacuating the bladder. The organ becomes, in this manner, gradually accustomed to the stimulus of the urine, until, ultimately, the night can be passed without inconvenience. If not broken in upon effectually, at an early period, it may persist for years. It was the expressed opinion of a distinguished individual, (*Sir Charles Bell*), that the urine is never discharged, except when the child is asleep on his back; and, hence, that the cure is a simple one:—he must accustom himself to sleep on his face or side: “the urine,” he adds, “is not passed, nor is he excited to dream of making urine while he keeps this position.” The view of Sir Charles ought to be kept in mind, but it is not, probably, of as extensive application as he supposed. It can be readily understood, that if a habit has been acquired of passing the urine during sleep in any one position, a change of position, by modifying the sensations, may interfere with it; but the effect would probably be only temporary; and hence—as has been properly remarked, (*Robt. Willis*),—whoever trusts to position alone, for the cure of incontinence of urine among children, will be sure to be disappointed.

One important part of the management is—to diminish the quantity of fluid used at supper, and even to dispense with the meal altogether. Tonics, astringents and excitants of the most varied kind have been suggested, with the whole train of internal and external treatment, recommended in cases of paralysis of the bladder; and, for a time, the new impressions made by them are favourable. Blisters, especially, and the various forms of counter-irritants—either by the irritation they induce or the dread occasioned by them—keep the child awake, and, in this manner, may prevent the incontinence for a time, but the effect is apt to wear off, and the habit to recur.

It has been advised, in very obstinate cases, where all the other means have failed, to introduce a bougie into the bladder; and

some have recommended, that it should be coated at the point with a stimulating substance, as the tincture of cantharides, applied in layers, one coat being permitted to dry before the other is laid on. The cases must be rare, indeed, where such a severe remedy could be considered necessary; and the same may be said of the different *juga*, and other mechanical contrivances, which have been applied for the purpose of preventing the passage of the urine. Some risk always attends their employment, and they do not strike at the root of the mischief. Dr. Robt. Willis thinks the best of the mechanical contrivances is that in which a firm, but not a hard, pad is kept applied, by means of a spring, to the urethra in the perinæum. "I am even willing," he remarks, "to allow, that considerable benefit may be derived from this apparatus, in some cases of incontinence, and though not permitted to be worn habitually, it may sometimes be recommended to young persons at particular times,—as when they are visiting from home, to insure them against the occurrence of their infirmity."

Recently, it has been proposed to apply the nitrate of silver to the orifice of the urethra, so as to excite acute inflammation of the part;—and a successful case is reported. When the urine passed over the inflamed surface, the pain produced by it was sufficient to awaken the patient, and arouse the sphincter vesicæ to the performance of its function. The caustic was repeated, and a cure shortly effected. (*E. W. Duffin.*)

In cases of habitual incontinence in the adult, or the aged, urinals are so contrived as to receive the urine of the male very readily; and where it is passed incontinently in the female, either owing to paralysis of the bladder, to sloughing of the organ, or to any causes of incontinence, a sponge may be so adapted to the parts as to receive the fluid as it passes away.

In cases of exstrophy of the bladder, a great source of inconvenience is the perpetual stillicidium that takes place from the exposed ureters. This inconvenience, also, may be palliated by sponges properly adapted to the part.

V. CALCULUS IN THE BLADDER.

SYNON. Calculus vesicæ; *Fr.* Calcul vésical; *Ger.* Blasenstein.

The different varieties of urinary calculi, and the method of preventing their formation, were investigated under the head of Calculous formations in the kidney. It is, therefore, but necessary to describe here the phenomena caused by them, and the appropriate managements when they remain, and accumulate in the interior of the bladder.

Diagnosis.—The symptoms, that denote the existence of calculus in the bladder, are—a frequent desire to pass the urine, with itching or an uneasy feeling in the glans, and in the region of the bladder. The pain in the glans sooner or later becomes very acute, and affords an example of the sympathy of continuity by which irritation may not be felt as much in the part of a mucous membrane

which is itself irritated, as at the point where the membrane commingles with the skin; and of which we have an analogous example in the itching at the nose, experienced by children labouring under irritation of the intestinal tube.

The character of the discharged urine varies. It may deposit any of the varieties of sediment, referred to under a former head; or its appearance may be natural—the deposition taking place slowly on the calculous formation already in the bladder. If the calculus be so small as to insinuate itself into the commencement of the urethra, the urine may only be discharged *guttatim*, with great pain and straining; or if larger, it may pass to the vesical orifice of the urethra, whilst the urine is flowing in a full stream, and arrest it suddenly. This is one of the best single signs of a calculus within the bladder; and the evidence is greatly confirmed, provided the flow be restored by change of position. Some patients are not able to pass their urine, unless they are on the side; and cases have existed in which others have been unable to evacuate the bladder unless they were on the head, and in almost a vertical position. (*Sir James Earle.*)

These are the symptoms usually present, but stones have been found in the bladder on dissection, where there had been little or no previous suffering; and, in severe cases, the pain may not always be present: after a long interval of entire or comparative ease, hard riding or severe concussion of the body of any kind, by changing the position of a calculus, which has been seated in a part of the bladder, that has become accustomed to its presence, to another situation, may give rise to an exacerbation, which may be accompanied with intense suffering. It rarely, indeed, happens, that the suffering is always equally severe,—and hence the expression—“a fit of the stone,” as we speak of “a fit of the gravel,” to denote exacerbation of suffering.

When the symptoms of calculus are at their greatest severity, the pain is excessive; the urine is passed by drops with the greatest agony; and it contains mucus and frequently blood—especially in the last portions that are voided.

The pain and itching of the glans penis causes the patient—especially if a child—to pull constantly at the prepuce, which is thus frequently elongated. (*Sir B. Brodie.*)

It is to be expected, that the prolonged anguish, which attends this—one of the most painful of disorders—must interfere greatly with the general health. The patient is prevented from obtaining a due amount of rest; the appetite fails; the whole system of nutrition becomes morbidly implicated; and death may supervene, induced by the protracted irritation, which wears away the powers of life.

Although it might be presumed, that the symptoms of calculus are sufficiently unequivocal, it is proper to remark, that unfortunate errors have been committed by even experienced observers, and that the operation of lithotomy has been performed, where no

stone has been found in the bladder. A striking case of the difficulty, that occasionally environs the subject, has been given by one of the most eminent of living surgeons, (*Sir B. Brodie.*) Sir Benjamin was consulted in the case of a boy between four and five years of age, who had a constant inclination to pass his urine, and who shrieked from pain as the urine flowed. He was perpetually squeezing the extremity of the penis between his fingers, and the urine was frequently tinged with blood. Sir Benjamin examined the boy again and again, and finally determined that there was no stone in the bladder. An occasional dose of calomel and rhubarb, with one of rhubarb and the sulphas potassæ cum sulphure in the intervals, dispelled all the symptoms in a few weeks. (*Robert Willis.*) In such cases, the facts, before referred to, should be recollected; which show, that vesical irritation not unfrequently acknowledges a renal origin.

In all cases of doubt in regard to the symptoms, it is of course indispensable, that the sound should be introduced into the bladder, but cases have occurred, where even experienced surgeons have been deceived, when this precaution has been over and over again adopted, and where they have performed the operation of lithotomy without any calculus being present in the bladder.

Pathological characters.—The appearances, presented by the bladder of one who has died of calculus, may be various. The usual signs of inflammation of the mucous membrane may be expected; the bladder may be more or less thickened, and diminished in size, in consequence of the inability to retain more than a certain quantity of urine. Morbid appearances may, likewise, be found in neighbouring organs,—as in the kidney, ureters, and prostate. The latter organ is sometimes greatly enlarged, and even ulcerated. The suffering, under such circumstances, is intense.

The calculus itself presents various characters, according to the precise deposition, that may be for the time existent. Most commonly the nucleus is lithic acid, and it has been presumed by many, that the nucleus has proceeded from the kidney and been detained in the bladder. Generally, however, if the renal calculus clears the ureter, it will succeed in passing through the urethra; and, so far as the author has had an opportunity of observing, the nucleus itself has usually been formed in the bladder. A clot of blood or any extraneous matter may be the cause of deposition, especially if the individual be, at the time, suffering under a calculous diathesis.

In the same calculus it is found, that the chemical nature of the deposition varies at different periods of its increment. If the nucleus be lithic acid, the deposition sooner or later becomes phosphatic, in the generality of cases. If the disease be recent, and the urine acid,—reddening litmus paper,—we may infer, that the calculus is of lithic acid; but if the symptoms of calculus have existed long, and been very severe, so as to affect the general habit, and the urine is at the same time alkaline, it may be pre-

sumed, that the phosphates are being deposited. In many cases, all doubt is removed by the deposition of sabulous matter in the utensil, which can be discriminated by the rules laid down under Renal calculi.

Treatment.—At all times, it has been a subject of anxious endeavour to discover a mode of breaking down or dissolving stone in the bladder; and even at the present day the ardour has not abated. Yet, the mass of the profession are of opinion, that whenever the stone becomes too large to be discharged *per vias naturales*, it can only be removed by an operation. The fact, that every urinary calculus may, and generally does, consist of layers of different chemical composition, would seem to render the problem very difficult of solution.

The different *lithontriptics*—as they are termed—which have been brought forward from time to time, are of extremely questionable virtues.

Of the mineral waters, that have been esteemed powerful agents in the removal of vesical calculi, the Vichy have been perhaps most celebrated; and their properties have been recently canvassed by scientific observers, whose opinions are worthy of all attention.

The fact, that these waters render the urine alkaline, could not fail to suggest their application in calculous affections. (*D'Arceet, Ch. Petit, Chevallier.*) It would not appear, that the destruction of calculi by this water is effected merely, or perhaps principally, in the way of solution, but that it is accomplished in a very considerable degree, especially as regards those of the triple phosphates, by a kind of disintegration of their component particles. When calculi consist of the oxalate or phosphate of lime, mingled with lithic acid, lithate of ammonia, or the triple phosphate, the Vichy water is said to attack and disintegrate them rapidly.

Vichy water contains a large amount of free carbonic acid, and nearly a drachm and a half of the bicarbonate of soda in every thousand drachms of the menstruum. Its action on calculi in the bladder seems to have resembled, in many cases, that which we have described as resulting from its application to them out of the body. Dr. Petit, of Vichy, has a collection of calculous nuclei, which were passed by patients suffering under stone, for which they drank these waters. The nuclei are said to show, generally, traces of solution or disintegration on their surface; and some of them appeared to have unquestionably undergone a very considerable reduction in size and weight since the commencement of the treatment.

This action cannot be regarded as the result of simple dilution, as the waters act much more rapidly on the lithic acid, lithate of ammonia, and the triple phosphate, than pure water. Besides greatly increasing the quantity of the urine, they exert a decided influence on its chemical constitution; rendering it rapidly neutral if previously acid, and afterwards alkaline: from being high coloured

it becomes pale, and, having deposited copiously, it becomes limpid and transparent. (*Robt. Willis.*)

The experience of many observers (*Mareschal, Patissier, D'Arcet, Ch. Petit, Chevallier,*) is certainly encouraging, and suggests the importance of employing the fictitious waters of Vichy, where the natural water is unattainable. For these, a formula is given at page 108 of this volume: the following is from the *Codex Medicamentarius*, of Paris.

Take of simple acidulous water, impregnated with twice its bulk of

Carbonic acid, $\bar{z}$ xxss.

Carbonate of soda, gr. xxxij.

Sulphate of soda, gr. xvj.

Muriate of soda, gr. iv.

Carbonate of Magnesia, gr. ss.

Muriate of iron, g. $\frac{1}{4}$.—M.

Under views, analogous to those which have directed the use of the alkaline mineral waters, the different alkalies and alkaline earths have been freely administered as lithontriptics. It is not probable, however, that either the mineral waters in question, or the alkalies, can be generally productive of benefit, except where the depositions are of the lithic acid or the lithates. Still, the facts must be borne in mind, that under protracted administration of the waters, and likewise of alkalies, combined with the free use of diluents, calculi of other kinds have experienced disintegration. Where, too, they have failed to dissolve or break down the calculus, they would seem to have greatly mitigated the suffering (*Robt. Willis*); but in what manner this is effected, it is not easy to determine. It may, indeed, be a question how far, in the cases narrated, the relief was dependent upon the remedy administered.

It is proper, however, to remark, that an eminent investigator of calculous diseases, (*Leroy d'Etiolles*), states, "that a certain number of calculi, instead of being dissolved by alkalies administered in baths or drinks, increase under their influence—at times, by the addition of a double salt of urate of soda and ammonia; at others, by the precipitation of a urate of lime; at others, by a more rapid deposition of the phosphates of lime, ammonia and magnesia; and, at others, again, by the formation of a carbonate of lime, which may add to the calculi already existing, or give place to depositions of a new kind."

M. Leroy's statement has been contested, since which he has adduced cases to show, that after the treatment of urinary calculi by the alkalies, carbonate of lime has been found on analysis in them; and he argues, that "as carbonate of lime scarcely ever exists in urinary calculi, its frequent presence, after the alkaline treatment, can only proceed from the carbonate of soda, the acid of which combines with the lime of the calculus and of the urine."

Acids—as elsewhere remarked—are given as antilithics; but very rarely as lithontriptics, unless when injected into the bladder. Both alkalies and acids have, indeed, been injected into that

viscus; and although cases of benefit derived from them have been published,—owing to the varying composition of the calculi, great caution has to be exerted in order to determine when either one or the other, or neither, is appropriate. Moreover, if the solutions are sufficiently strong to exert any effect upon the calculus, they can scarcely fail to induce irritation of the bladder, and an aggravation of all the symptoms.

At one time, it was supposed, that galvanic electricity might be brought to bear on calculi in the bladder; (*Prévost and Dumas*); but experience has not sanctioned the supposition, and it is not now used.

A case has been recently recorded, (*Ségalas*), in which spontaneous softening of a calculus had occurred. Eleven days before its extraction by the high operation, it was so hard as to resist the lithotritic instrument; but when removed, it was found to be softened on its exterior to the consistence of paste, and yielded under the pressure of the forceps even to its very centre. The calculus was found on analysis, by M. Lecanu, to be composed of phosphate of lime and animal matter, and the softening coincided with a catarrhal inflammation of the bladder.

Should all means of destroying the calculus fail, it must be removed either by the operation of lithotrity or of lithotomy. Should there be reason, however, to presume, that the calculus is very small—small enough to pass through the urethra, it has been suggested to allow diluents, and medicines according to the circumstances of the case; and that the patient—with his bladder full of urine—and resting on his hands and knees, should repeatedly endeavour to detach the calculus by moving or shaking the pelvis from side to side, or up and down, and that he should then make water suddenly, and in as full a stream as possible. (*Robt. Willis*.) The following plan, too, has been recommended. Let a large bougie be introduced into the bladder, and be retained there. Then let the patient drink freely of some mild diluent, so that the bladder may become loaded with urine. When he can bear the distension of the bladder no longer, let him place a vessel on a chair, and, leaning forward over it, withdraw the bougie. The urine will follow in a full stream, and the calculus may probably accompany it. This mode of treatment, it is affirmed, (*Sir B. Brodie, Robt. Willis*), has been successful in removing calculi, for which an experienced surgeon had recommended the patient to undergo the operation of lithotomy.

When the calculi cannot be got rid of, and the patient is unwilling to submit to the painful operations of lithotrity or lithotomy, or the case is not one that is considered to be appropriate for them, palliatives are demanded: opium, or some of its preparations, become indispensable, with perfect quiet and the warm bath, or semicupium. Anodyne injections into the rectum likewise afford essential benefit.

On the whole, the medical treatment of vesical calculi, consists

of a combination of that required in cases of calculous depositions in general, and of that demanded in cystitis, combined with narcotics in such doses as to allay the excessive pain, often induced by the calculus, especially if it be of the rough exterior, which is one of the characteristics of the mulberry calculus especially.

VI. BLOOD IN THE URINE.

SYNON. Hæmaturia, Hæmaturesis, Mictus cruentus, M. sanguineus, Urina sanguinea, Hæmorrhagia Hæmaturia, Bloody Urine; *Fr.* Hématurie, Pissement de Sang; *Ger.* Blutharnen.

Blood, mixed with the urine, may proceed from different parts of the urinary organs; and it is not always an easy matter to decide as to its precise source. Usually, it is symptomatic of some morbid condition; but, like other hemorrhages, it may occur, if not as an idiopathic affection, as one whose immediate morbid cause it is not easy to detect.

Diagnosis.—This is generally a matter of no difficulty. Frequently, the blood is coagulated; at other times, it subsides to the bottom of the vessel in a form not to be mistaken; but, at others, high coloured urine may be thought to be bloody. It has, likewise, been observed to issue from the urethra in the form of concrete fibrinous and solid coagula, which have imposed upon superficial observers, who have taken them for worms. At times, too, these coagula would seem to have been detained in the urethra, where they have had a channel formed in them by the urine, and have ultimately been discharged in the form of tubes of greater or less capacity, and representing sufficiently well the dimensions of the canal. (*Andral.*)

At times, the blood is so thoroughly mixed with the urine, that doubts may exist as to its presence. Under such circumstances, if it be permitted to rest for some hours, the blood will be deposited, so that the urine, which was previously turbid, will become clear. At the bottom and around the sides of the vessel, a slight layer of colouring matter is deposited, which, when put on linen or paper, tinges them red; such, indeed, is usually the case with the urine even when containing blood only in small quantity. If a heat, too, above 169° be applied to urine which contains blood, the albumen will be coagulated, and deposited with the fibrine.

Causes.—The most common causes of hæmaturia are of a mechanical kind;—for example, calculi impacted in the kidney, ureter or urinary bladder. It may, likewise, be induced by blows on the loins or abdomen, and by violent inflammation of the urinary organs,—although transudation of blood, under the last pathological conditions, are not as common as in the inflammation of other mucous membranes. Occasionally, hæmaturia is an indication of malignant disease of the kidney, and also of fungosities at the inner surface, and especially near the neck of the bladder. It occurs, too, as symptomatic of disease of the prostate gland, and of the lining membrane of the urethra.

When the blood proceeds from the urethra, it usually flows out, both when the urine is passed and in the intervals, and when it is discharged with the urine it is not mixed intimately with that fluid. Moreover, the history of the case will generally lead to a correct appreciation. It frequently accompanies manifest disease of the prostate, or follows the introduction of some instrument into, or some mechanical violence done to, the canal of the urethra. Calculi, especially if rough on the surface, may lacerate the membrane in their passage. In cases of severe inflammation of the lining membrane of the urethra, whether simple or specific, should blood be discharged, the nature of the attendant symptoms cannot fail to indicate its source.

When the blood transudes from the vessels of the bladder, there is generally more or less uneasiness in the region of that viscus. In such case, the blood is not always mixed intimately with the urine, but swims upon it in irregularly shaped clots, the rest of the fluid being clear, or but slightly turbid. On standing, the blood is deposited at the bottom and sides of the utensil.

When the transudation occurs in the kidneys, there may be no signs of uneasiness in the region of the bladder, or in the urethra: yet it must be borne in mind, that the renal condition, which gives rise to it, may be accompanied with symptoms that are referred to the bladder. Usually, perhaps, there is pain or uneasiness in the lumbar region. In this case, the blood is mixed intimately with the urine;—distilling, as it does, from the pelvis of the kidney, it cannot fail, in its course down the ureter, to become closely incorporated with the urine, which, when discharged from the bladder, has a blood-red appearance, not in part, but wholly.

It need scarcely be said, that the presence of symptoms of nephritis or of cystitis, with the appearances of the urine above mentioned, will aid in the differential diagnosis.

It would seem, that in cases of amenorrhœa, a vicarious discharge sometimes takes place from the urinary organs; and a similar discharge, especially from the urethra, has been noticed in the course of purpura hæmorrhagica. Bloody urine has, likewise, been observed to follow the use of cantharides internally; and it is not an uncommon consequence of the internal administration of the oleum terebinthinæ in rheumatic and other cases.

Pathological characters.—There are none, which belong essentially to hæmaturia. They must of course vary with the cause and seat of the affection.

Treatment.—This, too, must vary according to the seat of the hæmorrhage, and the condition of the system. No matter whence it precedes, if the transudation be accompanied with active symptoms, it must be treated as active hæmorrhage proceeding from any other mucous membrane. Blood may be taken from the arm, or by means of cupping or leeches from the loins, perineum, or verge of the anus; perfect rest be enjoined, with a dry diet; and cold injections be thrown into the rectum. On the other hand, should the

transudation be owing to thinness of blood, or to the condition of solids that characterizes purpura, the remedies become necessary, that are elsewhere shown to be appropriate in that morbid condition. In such a condition, along with the ordinary remedies for arresting atonic hemorrhage, the iodide of iron will be found a valuable remedy. (*Liquor. potassii iodidi*, gtt. xv., ter die.) It possesses not only tonic properties, but adds to the coagulability of the blood;—increases, in other words, the action of the system of nutrition of the vessels; and prevents their parietes from being so permeable; and, by increasing the consistence of the blood, renders it less penetrative.

In all cases, the bowels should be kept open by the *oleum ricini* or any other gentle laxative.

When hæmaturia succeeds to a sudden suppression of the menses or hemorrhoidal flux, it is advised, that we should do all in our power to restore those discharges,—a result by no means easily accomplished. We certainly have no remedy, which is deserving of the title of an emmenagogue, under all circumstances. Leeches may, however, be applied to the vulva or to the anus, and it has been advised to throw gently excitant vapours into the vagina. (*Andral.*)

Where the fluid coagulates in quantity in the bladder, and forms a solid mass, it has been recommended to introduce the catheter, in order to break down the clot. This must be practised with caution. It has, likewise, been advised to inject warm water into the bladder, to wash away the clots.

Where the discharge of blood takes place from the urethra, the hemorrhage may be controlled, when within reach, by pressing the canal between the finger and thumb, and afterwards applying a large compress to the part by means of a T bandage, so as to keep up the necessary degree of pressure. (*Mackintosh.*) Generally, however, the seat of the hemorrhage is in the bulbous or prostatic portion of the urethra, where no pressure is available. The effect of cold applications to the perinæum and to the lining membrane of the rectum is generally, in such cases, marked.

VII. CANCER OF THE URINARY BLADDER.

SYNON. Cancer vesicæ urinariæ; *Fr.* Cancer de la vessie; *Ger.* Blasenkrebs, Harnblasenkrebs, Krebs der Harnblase.

This affection is not common, and still less commonly does it attack the bladder primarily. Usually, this viscus becomes implicated in cancerous affections, which commence in the rectum; and in the female, in the uterus also. When it does appear, it is usually in conjunction with manifest indications of the cancerous diathesis.

Diagnosis.—The symptoms are those of chronic cystitis, generally accompanied by the presence of a hard, lancinating tumour in the hypogastrium; and the discharge of a purulent fluid in the urine, and frequently of blood,—with fragments of decomposed flesh exhaling a most repulsive odour.

The disease may be of protracted duration, but frequently runs its course rapidly.

Pathological characters.—These are similar to what is observed in cancer of other internal organs. Where the tumour has begun in the bladder, it is usually found to have commenced in the sub-mucous cellular tissue, whence it proceeds in other directions, occasionally passing outwards, and contracting adhesions with the sides of the pelvis, the uterus, and the bowels. These tumours are sometimes of a complicated nature,—scirrhus, cartilaginous, and fungous; and they have been found in great numbers at the internal surface of the bladder, and of a soft medullary texture.

Treatment.—As the disease can generally be merely suspected during life, it can rarely be met by any appropriate treatment. When it is diagnosticated accurately, it must be treated like cancer of the kidney or of any other internal organ.

CHAPTER V.

DISEASES OF THE SKIN.

THE researches of anatomists have shown, that the cutaneous envelope is composed of at least four layers—the epidermis, the rete mucosum, the corpus papillare, and the corium; separated from the subjacent parts by cellular membrane.

The epidermis is the thin pellicle raised by a blister, and is probably a secretion from the true skin, which concretes on the surface. Recent anatomists (*Breschet* and *Roussel de Vauzème*,) affirm, that there is a “blennogenous or mucific apparatus” for the secretion of this mucous matter, composed of a glandular parenchyma or organ of secretion, situate in the substance of the derma, and of excretory ducts, which issue from the organ, and deposit the mucous matter between the papillæ.

In the next layer—the rete mucosum—the colouring matter of the dark races seems to be seated; and it is affirmed, on the authority above cited, (*Breschet* and *Roussel de Vauzème*,) that there is a particular “chromatogenous or colorific apparatus” for producing this colouring matter, composed of a glandular or secreting parenchyma, situate a little below the papillæ, and presenting special excretory ducts, which pour out the colouring matter on the surface of the derma.

The corpus papillare, or, as it has been termed, the “neurothelic or mammillary nervous apparatus,” (*Breschet*,) is situate next below the rete mucosum. It consists of a collection of small papillæ, formed by the extremities of nerves and vessels, which, after having passed through the corium beneath, are grouped in small pencils or villi in a spongy erectile tissue, which are readily seen when the

corium is exposed by the action of a blister. These villi are the papillæ of the skin.

The corium or true skin is the innermost layer, and consists of a collection of dense fibres, intersecting each other in various directions, and leaving between them holes for the passage of vessels and nerves.

These four strata, which constitute the skin, in its ordinary acceptance, are comprised in the thickness of two or three lines.

The cellular structure beneath the true skin is so arranged as to allow it to move readily on the parts beneath; but in a state of disease the skin may be firmly bound down by plastic lymph.

All these layers are implicated in many of the cutaneous affections, that will fall under consideration,—and in addition to them, there are certain appendages to the skin, that are likewise concerned:—for example, the sebaceous follicles or crypts, which are most abundant, where there are folds of the skin, or hairs; or where the surface is exposed to friction. They separate an oily fluid from the blood, and pour it over the surface to lubricate it, and defend it from the action of moisture. When the follicle becomes inflamed, and the secretion cannot escape, a common cutaneous affection results,—*acne*.

Another appendage of the skin—the hair—is likewise interesting in the pathological relations of the cutaneous envelope. The roots of the hair are in the form of bulbs, taking their origin in the cellular membrane; and in certain forms of cutaneous disease—as in *porrigo*—their nutrition becomes morbidly affected and they fall out.

The various cutaneous diseases must be regarded as resulting from some modification in the action of the glandular apparatus, which secretes the layers of which the skin is composed. This modification may be dependent wholly upon local influences, and may require merely topical remedies to induce a new action in the part; in other cases, however, the affection appears to be connected with some *vice*, which can only be reached by remedies, that modify the state of the circulating fluid, and, through it, the action of the glands and vessels of nutrition of the part affected. In such case, the local application of appropriate remedies is often of signal service,—either employed alone, or along with suitable internal agents. The external applications come into immediate contact with the parts affected from without; and the internal agents produce their influence from within, in the manner already described, so that obstinate affections may yield to this joint action, which resisted either singly.

The classification of cutaneous diseases has always been a matter of difficulty. By some, they have all been ranked amongst phlegmasiæ of the skin,—either acute or chronic, (*Andral, Rostan, J. Green*); but it is more than questionable, whether many of them can fairly be esteemed of an inflammatory nature. The nutrition of the skin is evidently altered, and the secretions from the different glandular parenchymata greatly modified; yet, as in

similar cases of perverted nutrition and secretion, it by no means follows that inflammation exists. Some, again, have arranged them under two general divisions:—the *first*, comprising those of local origin, or dependent on the skin alone,—the *second*, those of a constitutional character, produced by some cause affecting the general system, and developed through the skin. (*Plumbe, C. N. Berkeley*, of Philadelphia.) Others have adopted an arrangement according to causes; for example, a recent writer, (*Dendy*), divides them into;—*First*, Diseases symptomatic chiefly of disorder of the alimentary canal, marked by increased cutaneous action, often by subacute or chronic inflammation; *Secondly*, Diseases indicative of debility, marked by languid cutaneous action, often the sequelæ of acute disorder. *Thirdly*, Diseases consequent on specific infection. *Fourthly*, Diseases consequent on external and common irritation; and, *Lastly*, Maculæ. The most common division, however, and that, which is liable, perhaps, to the fewest objections, in a practical point of view, is according to the elementary forms. It is the one adopted by the best dermatologists, (*Plenck, Willan, Bateman, Bielt, Rayer, Jonathan Green, Schedel*), and, according to the gentleman last cited, is now followed in all the medical schools of Europe. It will be adopted in this work. Those diseases, however, in which the febrile affection appears to form a prominent and essential part—the cutaneous disease being merely one of the phenomena—it may be well to consider elsewhere, in consequence of their analogy with each other, and with febrile diseases in general. On this account, most of them have been thrown together under the head of Eruptive Fevers.

Arranging the different cutaneous diseases according to their elementary characters, eight divisions may be admitted:—1, the *exanthematous*; 2, the *vesicular*; 3, the *bullar*; 4, the *pustular*; 5, the *papular*; 6, the *squamous*; 7, the *tubercular*; and 8, the *furuncular*. To these may be added the *maculæ* of certain writers; and some other affections that do not readily admit of classification.

SECTION I.

EXANTHEMATOUS DISEASES OF THE SKIN.

SYNON. Exanthemata; *Fr.* Maladies exanthémateuses; *Ger.* Ausschlagen, Fleckigen Hautkrankheiten.

These diseases, as a class, have been considered to be acute phlegmasiæ, (*J. Green*;) but some of them are certainly very different in their characters from the true inflammation of the skin, which characterises erysipelas. They would seem, indeed, to partake rather of the nature of hyperæmia—*Dermohémie*—(*Piorry*), than of positive inflammation. They are all characterized by

diffused redness, but are not all painful to the touch; little soreness, indeed, generally accompanies measles, scarlet fever, or nettle-rash, whilst the inflamed skin is remarkably sensitive in erysipelas. In the latter disease, too, the inflammation often extends to the cellular membrane beneath, giving rise to infiltration of various kinds. In the other exanthematous affections, the tumefaction, sometimes seen, is owing also to infiltration; but it is of a serous fluid, which is readily taken up. It never happens, that the cutaneous inflammation, which constitutes the efflorescence in the view of many, terminates in suppuration, or in any of the ordinary terminations of inflammation.

The chief diseases that belong to this division, are measles, false-measles, scarlet fever, urticaria, erythema and erysipelas. Excepting erythema, however, they are eruptions accompanied by marked constitutional symptoms, and will, therefore, be considered elsewhere.

ERYTHEMA.

SYNON. Inflammatory blush, Intertrigo, Maculæ volaticæ, Efflorescence; *Fr.* Erythème, Dartre érythémoïde; *Ger.* Hautröthe.

This is one of the most common affections of the skin, and is distinguished by the occurrence of red, slight, superficial, and irregularly circumscribed blotches, of various extent, upon the cutaneous surface. It is usually acute, lasting from two to ten or twelve days.

Erythema is, at times, a mere local affection:—the chafing of contiguous surfaces, as between the folds of the skin of infants, and of corpulent adults, in which there is inflammation of the skin, attended or not by a purulent or muco-purulent discharge, is of this character. It is the *Intertrigo* or *Erythema Intertrigo* of writers. Acrimonious discharges give occasion to an affection of the same kind.

Many insects induce an inflammation of the cutaneous surface; and the irritation of a wound or ulcer, and distension of the integuments by effused fluid,—as in œdema,—occasion more or less cutaneous inflammation, which might properly be classed under this head. (*J. Green.*)

Many varieties of erythema have been enumerated by writers on cutaneous diseases. The *erythema fugax* comprises the patches, that sometimes appear upon different parts of the body in febrile diseases; in children whilst they are teething, &c. &c.; and that extensive form of the disease, in which, under the influence of some constitutional cause, the whole surface of the body becomes suffused with a blush of different degrees of intensity, accompanied with a sensation of heat and dryness of the skin, which retains the print of the finger, or whole hand when applied to it.

In the *erythema papulatum*, of authors, the patches are at first somewhat papulated. It appears in females, and young persons more especially, and particularly on the face, neck, breast, and

arms; being generally preceded by evidences of constitutional disorder. When the elevations are like small lumps, it constitutes the *erythema tuberculosum*.

A more severe form is the *erythema nodosum*, in which the patches are of larger size than in the last. The spots, too, are raised, as if they would suppurate; but they never do so. They generally continue to be perceptible to the touch for ten or twelve days, when they recede, leaving bluish or yellowish marks behind them, which disappear in a week or two.

The *erythema læve* is that which follows any unusual distension of the skin, as in anasarca. When the integument contracts to its ordinary dimensions, extensive cuticular desquamation follows.

The *erythema centrifugum* attacks chiefly the face, commencing by a small slight papular red spot, which gradually increases in circumference, and at times invades the whole face. It is essentially chronic in its character. (*Biett, Schedel.*)

The *erythema acrodynum* (*Biett*) is an epithet given to the disease, elsewhere described, under the head of Acrodynia.

Treatment.—Erythema requires very simple management. Where it is produced by the abrasion of surfaces, that are in contact,—washing with tepid water, and afterwards dusting the parts with some fine powder,—as powdered starch, or finely levigated calamine, are sufficient. This is the plan pursued to prevent and to cure the chafing in children. At times, it is requisite to keep the surfaces separate by an intervening rag or lint; and it may be necessary to wash the excoriated surfaces, produced in this way or by acrid discharges, with gentle astringent washes, as the liquor plumbi subacetatis dilutus, or a solution of the sulphate of zinc.

R.—Zinci sulphat. gr. xv.
Aquæ, ℥vj.—M.

In the erythema, which is produced by the bites of insects, or by any form of poisoned wounds,—the application of hartshorn, or of spiritus ammoniæ aromaticus, or spiritus ammoniæ succinatus, often affords marked relief, and in a very speedy manner.

Where the erythema is dependent upon constitutional causes,—as in the different varieties described, it will cease with their removal. Usually, spare diet, perfect rest, gentle cathartics, and the tepid or vapour bath are sufficient to accomplish the cure.

SECTION II.

VESICULAR DISEASES OF THE SKIN.

SYNON. Vesiculæ; *Fr.* Maladies vésiculeuses; *Ger.* Bläschen.

Vesicular diseases of the skin appear under the form of small, acuminate collections of transparent fluid effused beneath the cuticle. This fluid either remains transparent throughout, or it be-

comes turbid and apparently purulent. As the fluid of the vesicles is absorbed, the epidermis often desquamates in the form of scurf, or thin scales; but if the fluid becomes of a sero-purulent character, it concretes into a laminated scab.

A difference has existed amongst writers on cutaneous diseases, as to the particular affections that ought to be classed under this division. Scabies, which is a chronic phlegmasia, was at one time placed amongst pustular affections of the skin, (*Bateman*;) but it is now generally considered to be vesicular. Difference of sentiment still exists in regard to varicella and vaccinia; but the former is unquestionably, in the generality of cases, vesicular; and, by some, the latter is thought to be so likewise, although it is more frequently, perhaps, classed amongst the pustular affections. A recent writer, indeed, affirms, that it is to all intents and purposes a pustular affection from the first. (*J. Green*.)

Considerable difference exists between the different diseases that are ranged under this head, both as regards the local and the general phenomena,—some of them being preceded by great constitutional disorder, whilst in others the general symptoms are slight or almost null.

The diseases, which fall under this head, are—miliaria, chicken-pox, herpes, eczema and scabies; the two first, however, being essentially eruptive fevers, will be treated of elsewhere.

I. HERPES.

SYNON. Herpes, Dartre, Olophlyctide, Tetter, Ecphlysis Herpes, Cytisma Herpes; *Fr.* Dartre, Herpès; *Ger.* Flechte, Schwinden.

The term “tetter,” like the French *dartre*, is used for various eruptions, but when we speak technically of herpes, we mean an eruption consisting of clusters of vesicles having inflamed bases; the clusters being separate and distinct from each other, and having skin of the natural hue between them. Usually, the vesicles terminate in from a week to a fortnight, in the formation of incrustations. The lymph in the vesicles is at first clear and colourless, but becomes gradually milky and opaque, and ultimately concretes into scabs. The disease is not communicable.

When the herpes is extensive, it is generally preceded by great constitutional disturbance, and almost always there is an inconvenient sensation of heat and tingling, and, at times, severe pain in the seat of the eruption.

The diagnosis of the disease is sufficiently easy:—a cluster of vesicles of different sizes crowded together upon an inflamed ground will always, with due attention, prevent it from being mistaken for any affection of a different nature.

Several species of herpes have been pointed out by different writers on cutaneous diseases. (*Willan, Bateman, Rayer, Schedel*.)

The form, which has been regarded as the type to the whole group, is the *Herpes phlyctænoides*, *H. phlyctenodes*; *Fr.* *Herpès*

phlycténoïde; Ger. *wasserblatterartige Flechte*. When it is seated on the lips and angles of the mouth, it is termed *Herpes labialis*; Ger. *Lippenflechte*; when on the prepuce, *Herpes præputialis*; and when in the form of a belt across the shoulders, or around the waist, the *Herpes zoster* or *Zona*, *Z. ignea*, *Z. serpiginosa*, *Erysipelas zoster*, *E. phlyctenodes*, *E. pustulosa*, *Cingulum*, or *Shingles*; Ger. *Gürtel*, *Flechtengürtel*. When, again, the vesicles of herpes, instead of appearing clustered into simple groups, or strung together into bands, assume an annular form, the disease has been termed *Herpes circinnatus*; and when each cluster of vesicles is surrounded by a number of erythematous rings, presenting different shades of colour, it has been called *Herpes iris*. (*Bateman*.) But, although dermatologists have made these subdivisions, it is scarcely necessary to say, that difference of locality or of appearance can make no essential difference in the affection. It is still herpes; and hence the multiplication of names according to difference of locality has been very properly animadverted upon by a recent writer. (*Mackintosh*.)

Causes.—These are very obscure. An eruption of herpes is not uncommon, when there has been febrile irritation present, especially of the catarrhal or gastric kind. A vascular eruption will appear upon the lips and angles of the mouth, which, as it generally occurs towards the termination of these affections, has been regarded by the unprofessional, and even by some of the profession, (*Mackintosh*), as a salutary effort of nature. The writer just cited, remarks, that he has often seen different forms of herpes, particularly that described as herpes zoster, occur in the course of bronchial inflammation, but more particularly when there were marks of a disordered state of the stomach and bowels.

Females—it is affirmed—are more subject to it than males, and the delicate more than the strong and the athletic.

Occasionally it breaks out annually, about the same period, and for a succession of years; and as the *rhus radicans* and the *rhus toxicodendron*—the “poison vine” and the “poison oak”—give rise to an eruption of the same character, the individual is apt to ascribe the disease to being “poisoned.” Two cases—in which a similar vesicular eruption was produced by the leaves of the *pastinaca sativa*, or common garden parsnip, on the extremities of individuals who worked in a garden where the vegetable was cultivated—were seen by the author, and are described in the *American Medical Intelligencer*, for Oct. 1, 1838, by one of the resident physicians of the Philadelphia Hospital. (*Vedder*, of Schenectady.)

Treatment.—The different varieties of herpes require but little medical management. The constitutional symptoms rarely run so high as to demand the use of the lancet. Commonly, low diet, with gentle cathartics, is all that is necessary. It will be advisable, however, whilst any febrile disorder exists, that the patient should be confined to the house.

In regard to the local treatment, difference of opinion has existed.

Whilst some restrict it to washing the parts with tepid milk and water, or with a mucilage; others recommend oleaginous and other applications, possessed, more or less, of astringent or excitant properties. The chloride of lime,¹ chlorine,² the hydrocyanic acid,³ creasote—in solution,⁴ or ointment;⁵ soot;⁶ the cyanuret of mercury;⁷ the deutiodide of mercury;⁸ the tincture of iodine, pencilled over the parts, especially in herpes circinatus, (*G. Billingslea*, of Alabama;) the iodide of potassium;⁹ and the codliver oil—*oleum jecinoris aselli*, administered both externally and internally—have all been employed.

¹ R.—Calcis chloridi, ℥ij.
Aquæ, Oj.—M.

² R.—Aquæ chlorin. ℥j.
Ol. olivæ, ℥j.—M.

³ R.—Acid. hydrocyan. ℥ij.
Aquæ, Oij.—M.

⁴ R.—Creasot. ℥ss.
Aquæ destillat. ℥v.—M.

⁵ R.—Creasot. ℥ss.
Adipis, ℥j.—M.

⁶ R.—Fuligin. p. j.
Adipis, p. ij.—M.

⁷ R.—Hydrarg. cyanur. gr. xvi.
Adipis, ℥j.

Ol. limon. gtt. xv.—M.

⁸ R.—Hydrarg. deutiodid. gr. xv.
Adipis, ℥ij.

Ol. bergamot. gtt. x.—M.

⁹ R.—Potass. iodid. ℥j.—℥iss.
Adipis, ℥j.—M.

Very obstinate cases may require the internal use of the preparations of iodine, combined with syrup, as advised under various chronic cutaneous diseases.

It has been recommended to open the vesicles early, and apply an emollient cataplasm over them, (*Mackintosh*;) and, it is affirmed, that in *herpes zoster*, where the pain is very severe, the best effects will be produced by the application of a dozen leeches to the inflamed part. “If done early, before many vesicles have appeared, the farther progress of the disease will be stopped.” (*Mackintosh*.) Small blisters, applied to the inflamed skin, in the vicinity of the vesicles—it is said—check their extension, and produce a shrivelling of those already formed. (*Plumbe*.)

II. ECZEMA.

SYNON. Ecephlysis eczema, Cytisma eczema, Humid tetter, Running scall; *Fr.* Eczème, Dartre squammeuse, D. vive; *Ger.* Hitzblätterchen, Hitzbläschen.

This is a common affection—like the last, not capable of being communicated from one person to another; and consisting of an eruption of small vesicles, clustered together in patches of no determinate size, and terminating either by the absorption of the fluid of the vesicles, or by their rupture, which occasions the formation of thin, flaky incrustations.

All the varieties of the affection, that have been admitted by dermatologists, may be included under two heads—the *acute*, and the *chronic*.

1. *Acute eczema*.—This generally appears and proceeds rapidly, terminating in eight or ten days. The eruption is preceded by a feeling of heat and tingling or creeping in the parts on which it is about to appear. The skin then assumes a rosy hue, and the vesicular eruption succeeds.

Three varieties of acute eczema are usually pointed out by pathologists. *a.* The *Eczema simplex*, which is limited to a small surface, and is rarely accompanied by general symptoms; but, at times, invades a greater extent, and is then preceded, and accompanied, by more or less indisposition. *b.* The *Eczema rubrum*, which is a much more severe form; occurring on a red inflamed surface, and preceded and accompanied by marked febrile symptoms. The parts, on which the eruption is about to appear, are hot, red and swollen;—and soon, a multitude of minute vesicles are seen which preserve their transparency for two or three days, and then assume a milky appearance. The vesicles give way, and the fluid escapes. The denuded skin now inflames; epidermic incrustations are secreted, which soon fall off, and are succeeded by others. The discharge from the vesicles, flowing upon a surface previously inflamed, adds to the inflammatory irritation, and gives occasion to slight excoriations, from which a watery secretion flows in greater or less quantity. Gradually, the serous exudation ceases; the incrustations become drier, and continue for a longer time; the skin returns slowly to its natural condition, and the disease terminates in between two and three weeks. Frequently, however, it continues for months and constitutes chronic eczema. *c.* The *Eczema impetiginoides*. This is the severest form of the disease; the three varieties can, indeed, be considered in no other light than as constituting so many grades in severity of one and the same disease. The inflammation is moderate in the first, and the vesicles are distinct, though collected in clusters, and transparent; in the second, it is more severe, and the vesicles are milky and confluent; in the third, it runs very high, and the vesicles coalesce from the first, so as to constitute a kind of bleb, which contain a quantity of sero-purulent matter, and pseudo-membranous formations. (*J. Green.*)

In the *eczema impetiginoides*, the tension, heat and redness of the skin are considerable, and the pain is very acute and lancinating. The vesicles very rapidly become purulent, and the liquid they contain concretes, and forms greenish laminated incrustations, which are not long in falling off, and expose a surface as red as carmine. If the eruption be very extensive, the amount of ichorous matter, discharged from it, is excessive. This form may become chronic, and persist for several weeks, passing from one part of the cutaneous surface to another, or it may become general; but usually it is confined to some part of the body.

2. *Chronic eczema*.—This may be the result of any of the three varieties described, but it more commonly succeeds to the two last. In such case, after the vesicles have broken, the inflammation augments, and invades the deeper seated layers of the skin, and even the subcutaneous cellular tissue. The skin, being continually irritated by fresh vesicular eruptions, and by the contact of the ichorous secretion, becomes excoriated and furrowed with deep fissures. The dressings require to be repeatedly changed, as the

discharge is often of an extremely disagreeable odour. They are liable, too, to be glued to the abraded surfaces, so as to require great care in their removal; even with every precaution, the affected parts are made to bleed, and are more and more irritated by every attempt to protect them. The surfaces, affected in this manner, have been compared to a blister in a state of active suppuration. They seem perforated, as it were, with a multitude of pores from which the discharge issues. The combined pain, itching and scalding are often almost intolerable, and prevent sleep.

When the disease is left to itself, it may continue for months and even years. Its decline is marked by the itching and smarting becoming more endurable; the discharge diminishing, and at length ceasing; the incrustations becoming successively drier and finer, and the surface of the corium exhibiting less evidence of inflammation. The skin, however, is generally long before it loses its preternatural redness and tender appearance.

There is no portion of the cutaneous surface, which is not liable to attacks of eczema; but parts, that are most plentifully supplied with follicles, seem to be more subject to it than others; hence, it occurs more frequently about the groins, scrotum, perinæum, axilla, bend of the arms and popliteal regions; and, in infancy, on the scalp; and, although the disease is identical, whatever may be its seat, it presents some peculiarities dependent thereon.

Eczema of the hairy scalp has been confounded, under the names of Tinea and Porrigo, with other affections of the same part, which are very different in their elementary forms. (*Schedel, Carswell.*) It occurs during dentition, and even afterwards; and the discharge is so profuse, that the head appears as if dipped in some glutinous liquid. By and by, the secretion dries into crusts, and mats the hair into little separate tufts. The affection usually invades the whole scalp; but generally the inflammation does not penetrate to the bulbs of the hair. The head is hot, and when the hair is removed by the scissors, the scalp appears red and tense, and the itching is so violent, that if the hands of the little patient are free, he will scratch until the blood flows. The lymphatic ganglions of the neck become inflamed, and sometimes suppurate; and in one case, which fell under the author's care, the inflammation terminated in gangrene.

Eczema of the face, at an advanced stage, and occurring in young children, has frequently been described under the names *Crusta lactea*, *Achores in faciei*, *Lactumina*, *Tinea faciei*, *Porrigo larvalis*, &c. It is very commonly coexistent with a like affection of the scalp. When the eyelids are attacked, inflammation of the conjunctiva is apt to be induced.

Eczema of the external ear, is a common and obstinate variety. Its characters are those of eczema in general; the ear is often swelled to twice the natural size, and the meatus auditorius externus so diminished, that total closure is at times apprehended, and

agents, such as pieces of prepared sponge, or dried gentian root have been introduced, so as mechanically to prevent closure.

Eczema of the organs of generation, of both sexes, is one of the most distressing affections that can be conceived. In the female, it commonly appears upon the labia majora; but, at times, the inflammation extends around, so as to produce great tumefaction of the parts, and intolerable smarting and itching. This affection must not be confounded with an inflammation of the inner surface of the labia, in which the follicles are found to be tumefied, over a red, injected surface, which is lubricated by a copious exhalation; but there is no erosion or consecutive desquamation—an important distinctive character, and one which prevents all mistake. (*Bielt.*)

Eczema often affects the scrotum; and, when it implicates the penis, erection is excessively painful, and occasions laceration of the derma, and occasionally a copious discharge of blood. When the disease attacks the anus, it gives rise to almost intolerable suffering, which it is not easy to obviate. The affection may be limited to the verge of the anus, or it may extend to the parts in the vicinity. When it is seated in the bend of the arms, the groins and the popliteal regions, excoriations and deep fissures may be produced, owing to the constant motion of the parts. Eczema around the nipple is apt to assume the chronic form, and to be extremely rebellious to every method of management.

When the disease appears on the upper or lower extremities, it must be diagnosticated by its elementary characters. It is in the aged that it is most frequently seen on the legs, whence it usually extends to the insteps and toes. When it is seated on the hands, it gives rise to a very troublesome and painful form of the disease. As the parts are extremely movable, every joint is, sooner or later, surrounded by deep chaps, which bleed whenever the fingers are used. The disease in these cases, often attacks the parts about the roots of the nails, and either occasions a deformity of the nails, or their total loss.

Causes.—It is generally admitted, that eczema is not a communicable disease, yet it is affirmed to have been transmitted *per coitum*. (*Bielt.*) A recent writer, (*Rayer*), asserts, that he has seen several cases of the kind. It would appear, too, that when the discharge is copious, the contact of the secretion may develop the eruption upon healthy parts. (*Rayer*.) Its causes are generally very obscure. An eczematous eruption would appear to be developed on the application of certain irritants to the cutaneous surface,—thus, exposure to the sun's rays gives rise to the "heat eruptions," *eczema solare*; the application of a blister or stimulating plaster; friction with mercurial or sulphurous ointments; and working in certain irritating matters, and, indeed, in matters that are not usually irritating—as sugar, flour, &c., may occasion it.

A form of eczema is likewise induced by the action of mercury on the system—the *eczema mercuriale*; and another from the use of sulphur—the *eczema à sulphure*.

Treatment.—This may be divided into that which is appropriate for the *acute* and for the *chronic* form. Acute eczema is commonly a slight affection; but the chronic is often a very serious one, resisting the most appropriate means of cure. It may, likewise, accompany lichen, scabies, impetigo, and ecthyma; and it has been seen to change its character, and put on the bulbous form of pompholyx. (*Bielt, Cazenave.*)

In the milder forms of eczema, it is but necessary to be abstinent and to enjoin perfect quietude, and the use of tepid bathing, especially to the parts affected, with gentle laxatives. Should the eruption, however, continue,—along with the tepid bath, the alkaline bath, made by adding five or six ounces of the subcarbonate of potash of commerce; or the sulphurous water bath, made by adding three or four ounces of the sulphuret of potassa, to an ordinary bath—say, of 20 gallons—may be recommended. A wash of the liquor plumbi subacetatis, properly diluted,¹ has also been advised to be kept applied to the affected parts.

¹ R.—Liq. plumb. subacet. ʒj.

Aquæ destillat. Oj.—ij.

In the eczema rubrum, and, *à fortiori*, in the E. impetigenoides more active treatment is needed. Blood-letting may be necessary; and it may require more than one repetition; leeches have also been advised around the parts affected, but their effect must be equivocal, for the reasons elsewhere stated. (See Erysipelas.) All excitant applications must be avoided, in these varieties, and the topical applications must be of a soothing character. Local bathing, with infusion of slippery elm, flaxseed, and similar emollient infusions, appear to afford greater relief than oils and ointments, which become rancid. (*Schedel.*) The oleum jecinoris aselli or codliver oil has been found, however, productive of much benefit. (*M. Hall.*)

It is hardly necessary to say, that when the causes are appreciated, they must be removed, if practicable.

In chronic eczema, both the acid and the alkaline treatment have been highly extolled; and, what is singular, they have been recommended in conjunction by a distinguished pathologist! (*Andral*) “In the chronic eczema,” says M. Andral, “we must prescribe the sulphuric lemonade, which is made as follows:—*Sulphuric acid*, ʒj., *barley-water*, a quart; mix. This lemonade is very efficacious. We may prescribe, at the same time, baths of starch, baths of gelatine, or alkaline baths; and, for drink, the following tisane may be given:—*Subcarbonate of soda*, ʒss.; *cherry water*, or *barley water*, a quart.

To allay the extremely troublesome itching, a bath, at 88° or 90° Fahrenheit, may be used; and, if this should fail, the alkaline bath described above. The sulphurous water bath has often an equally beneficial effect. With the same view, a wash of the liquor plumbi subacetatis, the emollient infusions already referred to, or the greatly diluted hydrocyanic acid,¹ or the aqua lauro-cerasi, may be prescribed.

¹ R.—Acid. hydrocyan. ℥ij.
Aquæ, Oij.—M.

When the disease has become indolent, still more powerful means are demanded. The sulphurous waters internally, and their employment externally, are often of essential service; the vapour bath—not too hot—is likewise of advantage; and it is advisable to administer such agents as—by modifying the condition of the blood, and, through it, that of the system of nutrition—may induce a salutary change in the diseased surface. The internal use of the arsenious acid,¹ or of the solution of arsenite of potassa—Fowler's solution, (gtt. viij. ter die,) or of the arseniates of ammonia or soda,² often proves extremely beneficial.

¹ R.—Acid. arsenios. gr. j.
Micæ panis, q. s. ut fiant pilulæ xij.—M.

Dose, one, three times a day.

² R.—Ammon. arseniat. gr. j.
Aquæ destillat. ℥j.—M.
Dose, eight drops, three times a day.

Small patches of very obstinate chronic eczema have been benefited by the use of excitant ointments, such as the unguentum hydrargyri oxidi rubri; the unguentum hydrargyri nitratis or citrine ointment reduced,¹ or an ointment of the protiodide or deutiodide of mercury,² or of creasote.³

¹ R.—Ung. hydrargyri nitrat. p. j.
Adipis, p. iv.—M.

² R.—Hydrargyri deutiodid. gr. vj.
Adipis, ℥j.—M.

³ R.—Creasot. gtt. xv.
Cerati simplicis,
Ol. olivæ, āā ℥j.—M.

Should any of these ointments prove too excitant, they may be reduced by an additional quantity of the lard, or of the cerate and oil, according to the precise excipient employed in the formula.

The internal use of the preparations of iodine, as advised under the different chronic affections of the skin, might, doubtless, also be of use here.

After all, perhaps, in these chronic cases, the most important benefit is to be expected from the revulsion in the whole system of nutrition induced by a thorough change in the influences that surround—and have been in the habit of surrounding—the patient. In this country, where travelling is within the means of almost every individual, the best change, especially if he has lived in any of the Cis-allegany cities, or indeed in any part of the lower country, is to send him to the White Sulphur Springs of Virginia, which are seated so far above the level of the sea as to furnish a thorough mutation in all the atmospheric influences; whilst the water, and the deposit from the waters—*Boue des Eaux*—are admirably adapted for the internal and external treatment of the disease. There are many other sulphureous waters, which, of themselves, would be equally well adapted for these obstinate eczematous cases, but few, which afford the other revellent advantages to the same amount as the White Sulphur waters.

In France, the waters of Baréges and Cauterets are especially extolled; in England, those of Harrowgate.

Some slight modifications in the treatment are demanded by the seat of the affection. If on the hairy scalp, the hair should be cut close frequently, in order that the emollient cataplasms may be freely applied. It has been recommended to combat the great swelling of the ears, caused by eczema of those parts, by the repeated application of small cupping-glasses with the scarificator on the mastoid region. The parts may, likewise, be covered by emollient and narcotic fomentations and cataplasms. The leaves of the *datura stramonium*, dipped in warm water, might be used, in such cases, as well as in eczema in general, with advantage.

It has been already remarked, that the meatus auditorius is occasionally closed up, and that, to prevent total obliteration, pieces of dried sponge, &c. have been introduced, but these are not indispensable, as the aperture returns to its natural condition on the subsidence of the swelling.

When the eczema occurs on other parts, it must be treated by the general principles already laid down.

III. SCABIES.

SYNON. Psora, Ecpyesis scabies, Phlysis scabies, Itch; *Fr.* Gale, Rogne; *Ger.* Krätze.

This is one of the most common and loathsome of cutaneous affections; and as it occurs amongst the poorest and filthiest classes in the greatest degree, it is considered a disgrace when met with in respectable persons; although all are liable to receive it from impure contact, and the disgrace is less in acquiring than in retaining it.

It is an affection that is highly communicable, and is characterized by minute vesicles slightly raised above the level of the skin, transparent at the top, and containing a serous viscid fluid. These vesicles are constantly accompanied by incessant itching, and, hence, the vulgar name of *itch* given to the disease. They may occur on every part of the body—the author has not seen them, however, on the face—but they are most frequently observed, especially at the commencement, between the fingers, and at the flexures of the joints of the limbs.

Scabies—it is believed by many—never arises spontaneously, but can always be traced as a consequence of infection. It is certainly, however, difficult—and, at times impracticable—thus to trace it. It is asserted, too, by some, that the time, which elapses between the infection and the appearance of the disease, has even been pretty accurately ascertained; that in children it varies from four to five or six days; in adults, from ten to twenty days, according to the season,—the period of incubation being longest in winter; and that, in the aged, the interval is yet further protracted, and still

more so when any internal inflammation exists. (*Schedel, Green.*) The period of incubation is not, however, as accurately determined as has been said; and the variation in its appearance, under the different circumstances just narrated, amply confirms this.

Diagnosis.—The first symptom of scabies is a violent itching in the parts affected, which is increased by the warmth of bed and by alcoholic drinks.

If these be now examined with the aid of a magnifying glass, minute vesicles are perceptible, which are of a slightly rosy hue in young and sanguine individuals, and of the same colour as the skin in the debilitated and the valetudinarian. These vesicles are usually seated, in the first instance, on the hand, between the fingers and on the wrists, because the disease is usually communicated by the contact of the hands. When the itching is excessive, as it generally is, the patient ruptures the little vesicles by scratching; and the viscid fluid escapes and concretes in small scales, or thin and slightly adherent incrustations. When the disease is permitted to run on, and but little attention is paid to cleanliness, the irritation of the cutaneous surface is at times so great, that other phlegmasiæ of the skin are engendered, which complicate the case, and render the diagnosis more difficult.

The affection—it would appear—rarely or never terminates spontaneously. If left to itself, it may continue for years, and even for the whole life. (*Andral.*)

It is an interesting, and not always easy, question, to determine whether a suspected case of scabies is really such; and the reputation of the young practitioner may, at times, depend greatly on his correct decision. In the diagnosis of this, as well as of every cutaneous affection, it is important to bear in mind the elementary form of the disease, which is unequivocally vesicular at its inception. From prurigo it may be discriminated by the circumstance, that in the latter, the eruption is papular, and is seated on the back, shoulders, and outer surfaces of the limbs, whilst the itch affects the folds of the articulations, the inner surface of the limbs, the abdomen, &c.

From eczema it may be known by the vesicles being united more in groups, and the parts being more inflamed than in scabies. Moreover, the eruption in eczema generally appears in parts where the perspiration is most copious, and the hair and sebaceous follicles are most abundant. It is accompanied, likewise, by a feeling of stinging rather than of violent itching.

The *experimentum crucis*, in all doubtful cases, would be the discovery of the animalcular cause of the itch; but this is not always easy, as will be shown presently.

Causes.—It has been already remarked, that many believe scabies to be always the result of contagion, but that it is extremely difficult to trace it in all cases. If, too, it be admitted to extend in this manner, unquestionably a predisposition is given by locali-

ties, diet, habit, &c. Certain it is, that the affection prevails more in some countries, and in certain parts of the same country, than in others. In Scotland, for example, it is so common, in many parts, as to have acquired the *sobriquet* of the "Scotch fiddle." It is also very common in Ireland, the north of England, and in France; and, recently, it has received a great deal of attention from the therapeutists of Germany. (*Vezin.*) In Scotland, and in the north of England, it has often been ascribed to the free use of oatmeal, but this would not seem to be an adequate cause.

Young people are more liable to it than old, and, in the army, it is said to be very rare to see an old soldier affected with it,—the subjects being chiefly recruits, who have recently joined, and who had either brought the disease into the service with them, or had caught it from other recruits,—they themselves being predisposed to it by a change of diet and habits. (*Mackintosh.*)

Clothes, worn by persons affected with itch, are frequently the vehicles of infection. It is not uncommon, too, for persons who have slept in the same bed as one labouring under the disease, to be attacked by it; and they, who have been cured, not unfrequently suffer by a recurrence to the same clothes which they wore whilst they were suffering under the affection, without having taken the precaution to purify them.

It is affirmed, that there are many examples of the communication of scabies from animals—and especially the dog—to man; and that some years ago, several workmen, at the Jardin des Plantes, contracted the disease by attending upon a camel affected with it. (*Andral.*) An anatomical assistant to the museum asserted, that the insect of this itch belonged to another species, but this was not confirmed by the researches of MM. Bielt and Schedel. (*Cazenave.*)

It was an old idea, that the eruption of scabies is occasioned by the irritation and burrowing of a peculiar insect, (*Ingrassias, Joubert, Moufet, Hauptmann, Redi, Cestoni, Linnæus, Fabricius, Latreille;*) but the difficulty in discovering it always had thrown doubts on its existence. Of late years, the subject has been revived, and the existence and characters of the insect established. In 1812, the *ex-pharmacien* of the Hôpital St. Louis, at Paris, (*Galès,*) affirmed, that he had examined more than three hundred of these animalcules, and found that they always had the same shape, and nearly the same size, with slight differences, which he ascribed to differences of sex. The great resemblance, however, of the insect described by M. Galès to the mites of cheese, threw distrust over its very existence; and a recent dermatologist, (*J. Green,*) affirms, that he had always inclined to side with those who maintained, that the insects, figured as the *Acarus scabiei*, and *Sarcoptes scabiei*, were nothing more than stray pediculi or cheese mites. He adds, however,—“recent inquiries would seem to place the existence of the acarus beyond the reach of doubt, and very lately, indeed, (Nov. 1836,) whilst passing through the wards of the Hôpital

St. Louis, under the guidance of the Baron Alibert, I had an opportunity of seeing Dr. Gras extract three specimens of living acari, with the point of a pin, from the hand of a female, recently admitted into the hospital to be treated for scabies."

It was not until the year 1834, and after several distinguished individuals had tried in vain, (*Alibert, Biett, Galeoti, &c.*) that the mode of discovering these insects was clearly appreciated.

A medical student from Corsica, (*Renucci*), who had frequently seen his countrywomen extract them, and had extracted them himself, showed that the acarus is not to be found in the vesicle, but at the end of a small reddish furrow, sometimes straight, at others crooked, and about two lines in length, which begins at the vesicle and ends at the insect. A minute, subcuticular white spot is often perceptible near a distinct vesicle, and, on raising the cuticle with a pin, a small white body, which moves when raised on the point of the pin, is seen: this is the acarus. (*Raspail*.)

A recent writer, (*Aubé*), regards the sarcoptes as a nocturnal animal, which profits by night to attack its prey on a multitude of points, and returns, in the day-time, to the dark furrow, which serves as an asylum for it. His inferences are—*first*, that the itch is symptomatic, and produced by the presence of an arachnoid insect, called *sarcoptes hominis*; *secondly*, that it is only contagious by the transmission of this insect; *thirdly*, that the contagion is frequent in the night, rare in the day; and *fourthly*, that the sole object of treatment ought to be, to destroy the acarus and its ova. (*Biett*.)

Similar opinions have been entertained by others, (*Albin Gras, Pariset*); yet it is not easy to understand, how scabies is so readily communicated by contact, under the idea, that it must be conveyed by the insects, as it is by no means an easy matter to extract them from the furrow where they are domiciliated.

It has been recently maintained by an author, (*Krause*), who believes in the inseparable connection between itch and the acarus, that the disease may exist in those, who wash themselves very often, or who have very tough skins, without any eruption;—the itching and the power of communication, he affirms, may be present, without any visible sign of the disorder except the burrows of the insects.

Treatment.—Notwithstanding the assertion of speculatists, that a host of diseases is caused by repelled itch, there can be no doubt, that the constitution is little, if at all, concerned in scabies, unless it has existed for a long time, and that it is perfectly safe and proper to remove it as speedily as practicable.

The most effectual mode for this purpose is, unquestionably, by the use of sulphur. Many forms of preparations have been employed. In mild cases, or such as occur in young children, the unguentum sulphuris of the American and British Pharmacopœias, which consists of one part of sulphur to four of lard, will be power-

ful enough, when conjoined with the internal use of sulphur, the very disagreeable odour being, in some measure, masked by the addition of a little oil of lemon or oil of bergamot; but in more obstinate cases, the unguentum sulphuris compositum of the Pharmacopœia of the United States, which contains,—in addition to the sulphur,—ammoniated mercury, benzoic acid, oil of lemons, sulphuric acid and nitrate of potassa,—may be substituted. The author is more in the habit of prescribing the unguentum sulphuris compositum of the London Pharmacopœia.

R.—Sulphur. ℥iij.
Pulv. veratri albi, ℥j.
Potassæ nitratis, ℥ss.
Saponis mollis, ℥iij.
Adipis, ℥ix.
Ol. bergamot. ℥xv.—M.

A recent writer (*De la Harpe*,) recommends the following formula for an ointment, which he has employed satisfactorily in upwards of 500 cases:—

R.—Sulphur. p. xvj.
Zinci sulph. p. ij.
Pulv. veratri, p. iv.
Sapon. mollis, p. xxxj.
Adipis, p. lxij.—M.

The ointment of Helmerich, modified by M. Bielt, is much used by many practitioners in France. (*Cazenave*.)

R.—Sulphur. p. ij.
Potass. carbonat. p. j.
Adipis, p. viij.—M.

Any of these, or of other ointments, of which the essential basis is sulphur, should be applied freely to the affected parts, at least night and morning, for five or six days. The ointment should be rubbed in before a good fire, and it is advisable for the patient to wear the same clothing, and perhaps even to keep his apartment. During the whole of this time, he should take internally either sulphur alone, (℥ss., night and morning, in milk,) or associated with the bitartrate of potassa.

R.—Sulphur.
Potassæ bitartrat. āā ℥ij.
Theriac. com. ℥vj.—M.

Dose, a teaspoonful, night and morning.

Some advise, that a fourth-part of the surface of the body should be rubbed over with the ointment used; and they affirm, that four inunctions are commonly sufficient to remove the disease; whilst others, again, are satisfied with one thorough inunction;—recommending, that the patient should be placed before a good fire in the evening; that he should be thoroughly anointed from the nape of the neck to the ends of the fingers and soles of the feet by an assistant; and that he should put on afterwards a pair of old drawers, socks and gloves, in addition to a calico night-gown, and betake himself

to bed, where he must remain for the next twelve or eighteen hours, when he may rise, go into a warm bath, and free himself from the remains of the application by means of soap, especially soft soap and a flannel. The soft soap—which is formed by a union of oil and potassa—has itself been brought forward of late, in Germany, as a remedial agent in cases of itch, and has been employed in many hospitals, (*Pfeuffer, Graff, Bermann, Sicherer, Cless,*) with very great success. It is cheap, and many of the writers cited regard it as one of the best methods of treatment in use.

The single application of sulphur over the whole body, as advised above, is the mode preferred by distinguished individuals, (*Abernethy,*) and it is undoubtedly, in most cases, all sufficient. If necessary, the inunction should be repeated.

The great objection to the sulphur—effective as it is—is the disagreeable smell, which announces, in language not very equivocal, the nature of the malady. On this account, persons of the better classes are often unwilling to have recourse to it. The ointments, too, are especially objectionable. Accordingly, the sulphurous water bath has been employed, as well as a liniment of the sulphuret of lime,¹ and where there are facilities for it, the sulphur fume bath may be administered once or twice a day.

¹ R.—Calcis sulphuret. ʒss.
Ol. oliv. q. s.—M.

To be rubbed twice a day on the palms of the hands, for ten or fifteen minutes each time.

Owing to the disagreeable nature of the sulphureous applications, many other preparations have been used—as the unguentum acidi nitrosi of the Edinburgh Pharmacopœia; the unguentum hydrargyri ammoniati; and the unguentum veratri albi of the Pharmacopœias. They are less offensive than the ointments of sulphur, but they are certainly less sure. The same may be said of the fumigations of chlorine, of the aqua chlorini,¹ creasote,² and chloride of lime.³

¹ R.—Aquæ chlorin. ʒj.
Ol. olivar. ʒj.—M.

² R.—Creasot. gtt. xxx.
Aq. destillat. ʒv.—M. or,
R.—Creasot. gtt. xxx.
Cerati,
Ol. amygdal. dulc. āā ʒj.—M.

³ R.—Calcis chlorid. ʒij.
Adipis, ʒviiij.—M.

According to experiments, made on the itch insect, a concentrated solution of the iodide of potassium kills it most speedily. It lives sixteen hours in vapour of burnt sulphur; three hours in water; two hours in olive oil; one hour in the acetate of lead; one hour in pulverized brimstone; three quarters of an hour in lime-water; twenty minutes in vinegar and spirit of wine; twelve minutes in a solution of sulphuret of potassa, and only from four to six minutes in a solution of the iodide of potassium. (*Albin Gras.*) So far, therefore, as these experiments go, an ointment of

the iodide of potassium,¹ would appear to be the best application to the parts affected.

¹ R.—Potass. iodid. ʒss.
Adipis, ʒj.—M.

During the use of the different remedies, above recommended, vesicular and pustular eruptions are apt to occur, which may complicate the case, and give occasion to much cutaneous inflammation. Should this be the case, the irritating applications must be laid aside, and emollient baths, topical or general, be prescribed. It may even be necessary to reduce the system somewhat by blood-letting, or cathartics, or both, but this can rarely be needed. The disease, when obstinate, would appear to have been rendered more tractable by this course.

The ectrotic or abortive method of treatment by cauterizing the vesicles has been occasionally employed; but it is obviously only admissible at the first appearance of the eruption. When the affection is extensive, it cannot be employed, as it could not fail to occasion great inflammatory irritation in the surrounding parts, and render the disease more obstinate. (*Cazenave.*)

After the disease has been strangled, the clothes should not be worn until they have been disinfected. Where the articles will admit of it, thorough washing with plenty of soft and yellow soap will be sufficient; or, in addition, they may be subjected, in an oven, to a high temperature; or to the fumes of sulphurous acid gas, produced by the ignition of a rag dipped in melted sulphur.

SECTION III.

BULLAR DISEASES OF THE SKIN.

SYNON. Bullæ; *Fr.* Maladies bulleuses; *Ger.* Blasen, Wasserblasen.

The blister, or elevation of the cuticle by subeffused serum, that follows the application of boiling water to the surface, or of a plaster of Spanish flies, may be esteemed a type of the bullar affections of the skin,—so called, from *bulla*, a “bleb.”

The affections classed under this division are but three—Pemphigus, Rupia, and Anthracion; the first of which will be considered under the head of Eruptive Fevers.

The blebs, characteristic of these affections, vary in size from that of a pea to that of a hen's and even of a turkey's egg. They make their appearance, at times, without any perceptible redness of the surface; and are usually small when first discovered, but increase rapidly, until they acquire their destined dimensions. In the early stages, the fluid in their interior distends them, but they soon become flaccid, and, to appearance, half filled. When first secreted, the fluid is commonly limpid or slightly tinged with blood; but, subsequently, it becomes turbid and often purulent.

When the blebs break, which they generally do speedily, their contents of course escape, and incrustations form, under which ulcerations of greater or less depth are apt to occur.

The parts of the body, on which bullæ are most frequently seen, are the extremities, especially the lower; but they may appear on every part of the body.

I. RUPIA.

SYNON. Ecphylsis rhyphia, Ulcus atonicum.

Rupia consists of an eruption of large flattish blebs, which are isolated, and contain a fluid, at first serous, afterwards puriform, and often bloody; which rapidly concretes into crusts of greater or less thickness and prominence. At the base of these crusts and scabs are ulcers of variable depths.

Rupia often resembles ecthyma, (*Willan, Bateman*;) they have, indeed, been regarded as varieties of the same disease. (*Plumbe, Mackintosh*.)

Different varieties of rupia have been described, but they do not differ materially from each other,—for example, the *rupia simplex*, which—as its name imports—is the simplest form,—the *rupia prominens*, which is distinguished by the greater size of the blebs, the greater thickness of the scab, and the depth of the ulceration,—and the *rupia escharotica*, which commonly occurs in children of debilitated habits, on the loins, thighs, and lower extremities; the blebs being flattened, of an irregular shape, and surrounded by a dark areola; the fluid growing thick and black, and when the blebs burst, the exposed surface presenting a painful excoriation, which soon degenerates into a foul ill-conditioned ulcer, secreting an unhealthy fetid ichor, and spreading both in depth and width.

Rupia, in general, attacks particularly the lower extremities, and sometimes the loins, nates, and other parts. It is not usually a dangerous affection. The sores, that succeed to the escharotic variety, are very difficult of management, but they generally yield to attention paid to the condition of the system that gives rise to them.

The rupia escharotica of infants is little or not at all distinguishable from the bullo-pustular *syphilide* of children born with secondary symptoms. (*J. Green*.)

Treatment.—As the eruption is connected with an impaired state of the system, it is important to remove this by the exhibition of tonics, such as the quinia,¹ the cold infusion of cinchona, (*Ziss. ter die*,) or any of the ordinary vegetable tonics—such as the calumba, gentian, quassia, &c. in infusion.

¹ R.—Quiniæ sulphat. gr. vj.

Acid. sulphuric. dilut. gtt. xv.

Aquæ, ℥iv.—M.

Dose, one-third part, three times a day.

The scabs ought in all cases to be softened off by poultices, and their fresh formation be prevented by some of the gently stimu-

lating ointments, such as the unguentum hydrargyri nitrico-oxydi, the unguentum hydrargyri nitratis, reduced by the addition of lard; the ointment of creasote, or of the protiodide or deutiodide of mercury, as recommended under another head, (p. 167.)

In very indolent cases, it is necessary to change the surface of the ulcers by the free application of the solid nitrate of silver, or of the nitric or muriatic acid; and in very indolent cases, it has even been found necessary to apply those acids in a state of concentration.

In all the varieties, when there is much constitutional or local excitement, antiphlogistics internally, and emollient applications externally, may be advisable; but in almost all cases, it will be necessary to have recourse to tonics at some period; and, in many cases, the practitioner will find it necessary to invoke their aid from the very first.

II. ANTHRACION.

SYNON. Pustula maligna, Vesicula gangrænescens, Malignant pustule, Malignant vesicle, Persian fire; *Fr.* Pustule maligne, Bouton d'Alep; *Ger.* Milzbrandcarbunkel.

The *pustule maligne*, as it is generally termed, is characterized by the appearance of a bulla or bleb, filled with a reddish sero-sanguinolent fluid, under which a small lenticular induration is formed, which is, in a short time, surrounded by diffused inflammation of an erysipelato-phlegmonous character. The inflammation terminates in gangrene, which spreads rapidly from the centre to the circumference of the tumour. (*Rayer.*)

This definition applies generally to the affection; but, at times, a white line of demarcation checks its progress; at others, however, the cellular tissue rapidly becomes disorganized, and deep caverns form beneath the skin.

The whole of the phenomena greatly resemble those produced by the bite of a venomous animal. First of all, there is considerable itching, succeeded, in a few hours, by the appearance of a small red spot like the bite of a bug, and, soon afterwards, by the bulla, which is small at first, and gradually augments in size.

When gangrene has struck the central part, the inflammation extends to a considerable distance around,—the skin being red, tense, and shining, and the subcutaneous cellular tissue swollen, infiltrated, and often emphysematous.

The affection is usually accompanied by great constitutional disturbance, and, in its progress, the symptoms become markedly typhoid, or typhous in a most malignant degree, and the patient often sinks, and dies within the first twenty-four hours of his malady.

When it terminates favourably, the phenomena are the same as in cases of local gangrene in general; a line of separation occurs, and the constitutional symptoms improve.

The disease is, of course, one of great danger; yet it may be, and often is, controlled by appropriate treatment.

Causes.—It has been the common belief, that anthracion occurs only from the contact of the matter of the carbuncle of animals, —*carbunculus malignus*; Ger. *Milzbrandblatter*,—or of the offal or bodies of such as have died of the disease. It appears, however, that it may arise idiopathically in man. (*Nicolai*.)

Treatment.—The plan, thought to be most successful, is to make incisions through the gangrenous parts, so as to permit escharotics to come in contact with the sound parts, and induce in them a new action. A strong solution of the nitrate of silver (gr. xx.—xl. ad aquæ ʒj.), or the liquid muriate of antimony, and diluted, or even strong, muriatic acid, may be applied by means of dossils of lint. By some, the potassa has been advised, (*Dzondi*;) and by others, (*Hancke*,) the chloride of zinc, strewed, a line thick, in a dry state, over the whole surface of the ulcer, the edges being surrounded with adhesive plaster, and a plaster placed over the chloride of zinc, with compresses, and an appropriate bandage. (See the author's *New Remedies*, 3d edit. p. 490, Philada. 1841.) These escharotics may be suffered to remain for a few hours, after which, turpentine dressings or warm poultices may be substituted.

If, on the next day, there be no appearance of an extension of the disease, the soothing treatment may be pursued, or poultices, to which the aqua chlorini has been added, or an ointment of the same,¹ or a cataplasm,² or ointment of chloride of lime,³ may be used.

¹ R.—Ceræ albæ, ʒij.

Leni calore liquefact. adde

Ol. oliv. q. s. ut fiat linimentum cui refrigerat. adde

Aq. chlorin. ʒiss.—M.

² R.—Calcis chlorid.

Sodii chlorid. āā ʒss.

Aq. destillat. Oss.

Farinæ sem. lin. q. s. ut fiat cataplasma.

³ R.—Calcis chlorid. ʒj.

Adipis, ʒj.—M.

Should, however, the sloughs be surrounded by a hard swelling, and a diffuse erysipelatous circle of inflammation, indicating that the disease is on the increase, the stronger caustics may have to be repeated.

The internal management—and, indeed, the external also—is essentially like that required in gangrenous stomatitis. Tonics are demanded, as soon as the malignancy of the affection is detected; and opiates, in full doses, may be needed to allay the suffering.

The disease is fortunately but rarely seen.

SECTION IV.

PUSTULAR AFFECTIONS OF THE SKIN.

SYNON. Pustulæ; *Fr.* Maladies pustuleuses; *Ger.* Pusteln, Blätterchen, Eiterbläschen, Eiterblattern, Eiterfinnen, Pustulösen Hautkrankheiten.

Some of the most interesting diseases of the skin belong to this class. They consist in small collections of purulent matter, which form in the cutis vera, or between the cutis vera and the cuticle.

The affections that fall under this division, or that are esteemed to be pustular in their elementary forms, are Ecthyma, Impetigo, Acne, Mentagra, Porrigo, Variola, Varioloid, Vaccinia, and Equinia.

The majority of this form of cutaneous phlegmasiæ are chronic in their character; one of them, however,—variola—is one of the most formidable diseases to which mankind are subject—the constitutional disturbance being generally considerable, and, at times, overwhelming. Many of them, although not acute in their character, are so loathsome as to render existence burthensome.

Pustules occasionally terminate by the absorption of the purulent matter; at other times, crusts or scabs are formed, under which ulcerations take place; and at others, again, they give occasion to indurations, called frequently, but unhappily, tubercles, inasmuch as they, in no respect, resemble the heterologous formations to which the term is now generally appropriated.

Discrepancy has existed amongst dermatologists, as to whether certain affections should be considered pustular or vesicular. Willan and Bateman, for example, class scabies amongst the former. The difference in these elementary forms of cutaneous diseases consists in the characters they present when first seen. The pustule is filled with consistent yellow pus, almost from the moment it appears; in the vesicle, the purulent matter is an after product of the continuing inflammation. The products of the two elementary forms of inflammation, also differ materially from each other; the incrustations of vesicles being thin and flimsy, and of a pale colour; those of pustules thicker, more solid, and generally of darker tints. (*J. Green.*)

Of the diseases that belong to this division,—variola, varioloid, vaccinia, and equinia will be considered under the head of Eruptive Fevers.

I. ECTHYMA.

SYNON. Ecpyesis ecthyma, Phlysis ecthyma, Phlyzacia, Agria, Scabies fera, Furunculi atonici; *Fr.* Dartre crustacée, D. fongueuse; *Ger.* Blatternflechte.

Ecthyma is characterized by an eruption of large round pustules, which are rarely numerous and distinct from each other; are seated upon an inflamed, hard base, and most commonly give occasion to

the formation of brownish scabs or crusts, of greater or less thickness. These leave after them reddish stains, and, occasionally, slight cicatrices.

It is generally unattended with fever, and is incapable of being communicated by contagion.

The disease may occur at all ages, and appears often to be induced in children by want of cleanliness. The author has frequently seen it caused by the irritation of the urine, where the child has been in the habit of wetting the bed, or where its diapers have been kept on too long. A variety of the disease is induced by friction with the ointment of tartarized antimony.

Ecthyma may be acute or chronic. The former generally runs its course in from one to two weeks; the latter may continue for several months; fresh and fresh eruptions of pustules taking place, which run slowly through their different stages.

In children of weakly constitutions, badly fed, and especially when convalescing from bowel complaints, with distended abdomen, a variety of ecthyma—the *E. infantile*, (*Willan*,)—not unfrequently occurs. In this, the size of the pustules is very irregular; the larger sometimes suppurating, and being followed by ulceration; but frequently, after threatening suppuration, they slowly disappear by cuticular desquamation.

A variety of the disease—ecthyma cachecticum—resembles rupia greatly, and attacks chiefly the legs of old and cachectic persons, who have lived intemperately. (*Willan*, *Schedel*.) Ecthyma and rupia have, indeed—as elsewhere remarked—been esteemed varieties of the same disease.

Treatment.—In an ordinary mild case of ecthyma, little more is required than rest, with tepid bathing, and the use of gentle cathartics.

When the affection, on the other hand, is chronic, and occurs in debilitated or cachectic subjects, it may be necessary to put the patient upon the vegetable or mineral tonics; or the preparations of iodine, especially the iodide of iron, (*liq. ferri iodid. gtt. x., ter die, ex syrupo*,) may be prescribed, with a proper attention to diet. As the general health improves, the eruption usually disappears; and this desirable result is favoured by the use of tepid or warm baths, and especially of the sulphurous baths.

Whilst the pustules are in an irritable state, emollient applications are all that can be employed; but the ulcers are, at times, exceedingly obstinate, and require to be touched with the sulphate of copper, the solid nitrate of silver, or a solution of the same.

R.—Argent. nitrat. gr. iv.—viiij.

Aquæ destillat. ℥j.—M.

II. IMPETIGO.

SYNON. Ecpyesis impetigo, Phlysis impetigo, Running tetter, Crusted tetter, Pustular or Humid tetter, Scall, Cowrap; *Fr.* Dartre crustacée, Lèpre humide, Melitagre; *Ger.* Feuchten nässanden Grind.

The term impetigo has been variously employed from Hippo-

crates downwards. Even amongst the moderns, it has been used so extensively as to include all chronic cutaneous diseases, in contra-distinction to the acute, (*P. Frank, Himly*;) but, by most writers on the diseases of the skin, its signification has been narrowed down, so as to include a pustular affection having the following characters. (*Willan, Bateman, Blasius, Most, Schedel, Andral, Plumbe, Green, Rayer.*)

Impetigo is characterized by the formation of a number of minute pustules, which may be distinct or clustered together,—breaking, and the fluid forming yellowish, thick, rough, prominent incrustations. These pustules are entitled by some *Psydracia*. (*Willan.*)

When the pustules are collected in clusters, so as to form circumscribed patches of various figure and extent, they constitute the *Impetigo figurata* (*Willan*), which occurs most frequently on the face. The patches are usually smaller and more circular on the upper extremities; and larger, oval and irregular on the lower. When, instead of being clustered together, the pustules are dispersed without any regular order, the term *Impetigo sparsa* is given to it.

The *Impetigo figurata* is the *Porrigio lupinosa*, *P. larvalis*, *Tinea granulata*, *T. mucosa*, *Crusta lactea*, *Mentagra infantum*, *Teigne*, *Dartre crustacée flavescence*—of writers. It occurs, as has been already observed, more frequently on the face, and especially on the cheeks of children during dentition; and is not necessarily preceded by constitutional disturbance. It commences, generally, with one or more distinct red patches, on which numerous small yellow pustules, nearly confluent, and attended with much itching, appear, and when the eruption is severe, a sort of erysipelatous inflammation precedes and accompanies it. The pustules burst within three or four days, and discharge a quantity of purulent fluid, which quickly dries into semitransparent, and very friable incrustations, bearing considerable resemblance to a layer of concrete honey. The discharge continues to ooze from under the scab, which grows thicker; and, when detached, exhibits a red inflamed surface, studded with numerous minute pores, from which the discharge proceeds. Around the clusters, several distinct pustules may generally be seen.

In the incrustated state, described above, the eruption usually remains stationary for two, three or four weeks, when the secretion diminishes; and the crusts fall off gradually and irregularly, leaving a red, shining, and very tender surface, which continues for a long time to exhibit traces of the disease, although it rarely or never leaves any permanent cicatrix, and is ready on the slightest irritation to recur. When the disease appears, however, on the face, it is very apt to assume the chronic type, owing to fresh and fresh eruptions presenting themselves. In such case, deep chaps and ulcerations of the skin may occur, yet still permanent cicatrices do not follow it.

The variety of *impetigo figurata*, which appears on the face has

been termed, also, *Crusta lactea*, *C. L. Infantum*, *Achores in Facie*, *Lactumina*, *Tinea faciei*, *Milk scall*; Fr. *Croutes laiteuses*, *Teigne muqueuse*; Ger. *Milchborke*, *Milchschorf*, *Ansprung*, *Freisam*. It has also been called *Tinea muciflua*, *T. mucosa*, *Impetigo larvalis* and *Porrigio larvalis*,—the two last names from its occasionally covering the face as with a mask. These follow the same course as in *impetigo figurata*, in general.

When *impetigo* attacks the hairy scalp, the pustules are still crowded together, but not so distinctly collected into clusters, as in common *impetigo figurata* of the face; they are of a whitish or pale yellow colour, and each seems traversed in its centre by a hair. They soon burst spontaneously, or owing to the scratching induced by the severe itching; and pour out freely a semi-opaque, pale, straw-coloured fluid, which moistens the hair, and concretes into small ragged masses, very like the granules of tapioca or bits of candied sugar. (*J. Green.*)

This variety of *impetigo* has been termed *Impetigo granulata*, *Tinea granulata*, owing to the granular form of the concretions, and *Porrigio favosa* by others. (*Willan.*)

In *impetigo* of the scalp, the inflammation extends, at times, to the subcutaneous cellular membrane, giving occasion to small and yet very painful, abscesses, which generally burst externally, but are sometimes absorbed. The lymphatic ganglions of the neck also swell, as in other painful diseases of the integuments of the head. From the matted hair, a discharge is constantly dripping, which has an extremely disagreeable odour, not unlike that of rancid butter, or spoiled cheese; but this appears to be partly—if not wholly—owing to a want of attention to cleanliness. Under the same influences, the matted hair may be full of pediculi.

The *impetigo sparsa* is more apt to attack the lower extremities, and it is accompanied with intolerable itching. The pustules generally make their appearance on the insteps, ankles and especially the outer parts of the legs, and run their course in much the same manner as the *impetigo figurata*. Fresh and fresh eruptions of pustules, however, present themselves, and invade the leg upwards, until, ultimately, it is encased in one continuous, rough, thick and adherent yellowish-brown incrustation, similar in appearance to the bark of a tree, and constituting the *Impetigo scabida*. (*Willan.*)

The disease is occasionally very obstinate,—frequently continuing for months, and even years, in spite of every attention; and implicating, at times, the derma, so as to give rise to intractable ulcers, and spreading even to the ends of the fingers and toes, so as to interfere with the nutrition of the nails, and to cause them to be distorted or lost.

Treatment.—When *impetigo* appears as an acute affection, it must be treated by antiphlogistic and soothing remedies. In the milder forms, the part may be washed with warm milk and water, or flaxseed tea; and mild ointments—as the unguentum zinci and

U. plumbi acetatis—be applied. In severer cases, where there is more inflammatory irritation, it may be advisable to take away some blood, and to prescribe saline cathartics. The scabs must be prevented, as far as is practicable, from forming, by tepid ablution of the kind prescribed above, followed by the application of either of the ointments, or of any other unirritating, but oleaginous preparation. Should the disease be seated in the scalp, the hair should be cut close or shaved off, and the greatest attention be paid to cleanliness. To favour the removal of the matted hair, an emollient cataplasim may be applied, so as to soften the concremented humour. After the inflammatory irritation has been subdued, gently stimulating ointments may be used,—as the unguentum hydrargyri nitratis or the unguentum creasoti, properly reduced. In some troublesome affections of the skin, especially of the hands, conjoining the characters of impetigo with erysipelatous redness and swelling, and inducing the most intense suffering, the textures were speedily restored to a healthy condition by the external use of the codliver oil—*oleum jecinoris aselli*—after all other remedies had been tried in vain. (*M. Hall.*)

It need scarcely be said, that the general health must always be attended to, as most of these cutaneous affections are largely connected therewith.

When impetigo is decidedly chronic, the habitual use of drinks, acidulated with the mineral acids—as the nitric or sulphuric—has been advised, with prolonged immersion in the tepid bath, or in one that is alkaline. The use of the stimulating ointments, recommended above, may also be advised; or of a lotion of the hydrocyanic acid.

R.—Acid. hydrocyanic. f. ℥iv.

Sp. vini rectificat. f. ℥j.

Aquæ destillat. f. ℥xss.—M.

This lotion has completely allayed the distressing and intolerable itching and tingling, after other external applications and the internal use of anodynes had been of no avail: the discharge was diminished, and rendered milder by it. (*A. T. Thomson.*) A solution of creasote has, likewise, been used successfully in a case of old impetigo. The cure was accomplished in about eight weeks.

R.—Creasot. ℥ss.

Aquæ destillat. ℥v.—M.

At first, the application caused so much heat and inflammation, that in eight days it was obliged to be discontinued, and afterwards it was alternated with fomentations of warm water, from day to day, until the cure was completed. (*Wolff.*)

Should these means not prove successful, the incrustations should be softened and washed away, either by the warm or the vapour bath, and the affected parts be touched with diluted muriatic, sulphuric or nitric acid. The proportion of one drachm to the ounce of water has been advised, but this must generally be too strong. It may be applied by means of a feather, and if it should prove too

irritating, the acid may be washed off by pouring cold water over the part. The sulphur fume bath has, likewise, proved a valuable agent in many obstinate cases. (*J. Green.*)

Along with these topical applications, must be conjoined the use of internal agents, which are adapted for modifying the function of nutrition. The preparations of arsenic are excellent in this respect. Fowler's solution, (liq. arsenit. potass. gtt. viij., ter die, ex aquâ;) or Pearson's solution,¹ or the arseniate of ammonia,² or the iodide of arsenic, (gr. $\frac{1}{10}$, ter die,) may also be given; but it is requisite to persevere in the use of those remedies for a long time, where the disease has been of considerable duration.

¹ R.—Sodæ arseniat. gr. j.

Aquæ, $\bar{z}$ j.—M.

Dose, ten to twenty drops, three times a day.

² R.—Ammon. arseniat. gr. j.

Aquæ destillat. $\bar{z}$ j.—M.

Dose, twenty to twenty-five drops, three times a day.

III. ACNE.

SYNON. Varus, Ionthus, Ionthus varus, Acna, Psydracia acne, Stone pock; *Fr.* Dartre pustuleuse disseminée; *Ger.* Hautfinne.

This cutaneous affection is characterized by small, more or less red and inflamed pustules, which penetrate the tissue of the skin to a greater or less depth, and proceed but slowly to suppuration.

Many varieties of this affection have been pointed out by dermatologists.—1. The *acne simplex*, which is seated on the forehead, face and shoulders,—the pustules appearing in the form of small, red and hard elevations, with an inflamed base, in which pus forms slowly, which is thin, and usually mixed with a thick subaceous matter. These dry off and form small almost branny scales, which, on falling off, leave a dark, red, raised mark, that disappears slowly. When the pustules are mixed with a number of black circular points, which are the orifices of follicles filled with sebaceous matter, and are frequently converted into pustules, we have the *Acne punctata*, *Punctæ mucosæ*, *Ionthus varus punctatus*, *Acne sebacea*, or *Maggot pimple*, commonly regarded as *grubs* or *worms in the skin*.—2. The *acne indurata* is characterized by larger pustules, which mature more slowly, and have a central core formed by the inflammation of a sebaceous follicle, and on this account both acne and mentagra have been classed (*Dendy*) under *Folliculosa*, or “diseased secretion of the follicles.” After having existed for two or three weeks, the tops of the pustules become yellow, and break, and suffer a yellowish pus to escape, and, by pressure, a kind of core is often forced out, which has been supposed to consist of the follicle itself, or at least of a sort of false membrane, which has taken its shape, and which represents a cyst containing a sebaceous matter. (*Andral.*)

It appears generally on the face, and is at times to a very trifling extent; but at others it is more severe, so that the face is covered with livid red indurated tumours; occasionally, also, it attacks the

back, where it leaves small, oblong, and indelible cicatrices. (*Schedel.*)

3. The *Acne rosacea*, *Ionthus corymbifer*, *Gutta rosea*, *Bacchia*, *B. rosacea*, *Coppernose*; Fr. *Dartre pustuleuse couperose*, *Couperose*; Ger. *Kupferhandel*, *Finnen in Gesichte*, is confined almost exclusively to the face, and often to the nose and cheeks adjoining. It presents different degrees. At times, it consists, almost entirely, of a red colour of the skin, which is more or less diffused and intense, accompanied by the appearance, here and there, of a few pimples, and followed by a slight branny desquamation. This redness by degrees becomes habitual, and is increased after taking stimuli. At other times, the surface of the face is rugous, and full of small projections; the veins of the nose enlarging, and being accompanied by deeper seated inflammation. Yellow pustules are frequently scattered over the red variegated surface, and the features undergo considerable change. The nose especially becomes tumid; and, at times, is double or triple its ordinary size; and more or less considerable tumours, of a rugous and livid character, form, especially on the *alæ nasi*, which give occasion to great deformity. (*Bielt.*)

The causes of acne are obscure. The two first forms occur generally about the period of puberty; but—as has been properly remarked—(*J. Green*,) what connection there can be betwixt the establishment of certain new capacities in the economy and an inflammatory affection of the sebaceous follicles of the skin, of an unpleasant nature, is not very evident.

The last variety—the *acne rosacea*—is so common a sequence of intemperate habits, that the terms *Grog-roses*, *Grog-blossoms*, *Bottle-nose*, Ger. *Weinblattern*, &c. have been applied to it. It occurs, however, at times, in those who are most abstemious.

Treatment.—Acne simplex requires little treatment. It is an affection of youth in both sexes, and generally disappears at the age of virility. Acne indurata is a more severe and rebellious variety; and acne rosacea is always obstinate, and frequently incurable.

In all forms of the disease, it is advisable, perhaps, to puncture the pustules so as to prevent their breaking of themselves, and to allow a free passage for the sebaceous matters, without injuring or destroying the follicular structure. This can be done by the point of a lancet, after which gentle pressure may be applied to force out the hard sebaceous matter. (*Mackintosh.*)

In cases of extensive eruptions of the acne simplex and acne indurata, especially if the patient be of vigorous habit, restriction from animal diet, occasional cathartics, and even blood-letting, may be advisable. In some of these obstinate cases, the author has found great benefit, as in other chronic cutaneous affections, from a thorough change of diet, and especially by putting the patient on the use of saccharine matter between the meals, so as to modify the condition of the chyle, and, through it, that of the blood,

and of the tissues in which the blood circulates. An ounce and a half of simple syrup may be administered with this view, about three hours after each meal. The quantity of animal food need not be materially diminished, and certainly, it ought not to be wholly withdrawn, for fear that a scorbutic condition might be induced, as is apt to be the case when a person, who has been accustomed to both animal and vegetable food, is restricted to either one or the other exclusively. With the syrup may be associated the iodide, or the ioduretted iodide of potassium.

R.—Solut. Lugol. gtt. x.—xx. ter die: ex
syrupi ℥iss. ter die sumend.

By a perseverance in this system for two or three months, gradually increasing the quantity of the iodine, the author has succeeded in removing some very rebellious cases.

The local applications in acne simplex, whilst there is much irritation, should be wholly emollient—such as the almond emulsion, infusion of slippery elm, flaxseed tea, decoction of bran, warm milk and water, &c.; but, where the affection is obstinate, lotions of a more stimulating character may be advisable,—such as alkaline washes;¹ or lavender or Florida water may be applied at night before retiring to rest.

¹ R.—Potass. carb. ℥j.—℥ss.
Aquæ, ℥j.—M.

Some advise, also, the corrosive chloride of mercury;¹ and the sulphurous waters have been found serviceable.²

¹ R.—Alcohol. dil.
Aq. rosæ, āā ℥ij.
Hydrarg. chlorid. corrosiv. gr. j.
—ij.—M.

² R.—Potass. sulphur. ℥ss.
Aquæ, ℥iv.—M.

In the acne indurata, the same general plan of treatment is necessary. It has been recommended, in addition, to employ general vapour baths, the vapour douche, and the cold sulphurous water douche. (*Schedel.*) It is in the acne indurata especially, that the ectrotic practice of opening the pustules early is advisable. It often prevents the formation of unseemly scars. The iodide of sulphur ointment¹ may be rubbed over the indurations, night and morning, with great advantage. (*Bielt.*)

¹ R.—Sulphur iodid. ℥j.—℥ss.
Adipis, ℥j.—M.

In very obstinate cases, it has even been advised to rub the solid nitrate of silver over the parts, to brush them over with one of the concentrated mineral acids, or to apply a blister when the eruption is not extensive,—with the view of changing the morbid action of the skin; but before these potent remedies are tried—if prudent to try them at all—the less hazardous should be first prescribed.

In regard to the acne rosacea, especial attention should be paid to diet. Everything stimulating should be strictly proscribed. If, however, the disease has been induced by habitual indulgence in

spirituous or vinous liquors, it may not be advisable to withdraw them altogether. Attention to the state of the general system is here particularly important. The eruption itself must be treated in the same manner as recommended for the other varieties. The syrup of iodine internally, and the ointment of iodide of sulphur externally, have, at times, done wonders. A lotion of the hydrocyanic acid,¹ in combination with small doses of the corrosive muriate of mercury, (gr. $\frac{1}{12}$ — $\frac{1}{8}$ ter die,) has been found highly beneficial. (*A. T. Thomson.*)

¹ R.—Acid. hydrocyan. f. ℥iv.
Sp. vin. rectific. f. ℥j.
Aquæ destillat. f. ℥xss.—M.

When the circumstances of the patient will admit of it, travelling air and exercise, with the revellent action of thorough mutation of the different influences surrounding him, will be all important, and where this is practicable, a resort to some sulphurous water, with the internal use of the same, and the application of the *marc* to the affected parts, may effect a cure. It would not seem, that the use of the general sulphurous bath has in all cases been beneficial. (*Schedel, J. Green.*)

When the eruption has disappeared, it has been recommended, as a precautionary measure against the return of the disease, to use a weak spirituous lotion, or a wash of the sulphuret of potassa, to the parts affected, for weeks and even months after all traces of the disease have disappeared.

IV. MENTAGRA.

SYNON. Sycosis, Varus Mentagra, Phyma Sycosis, Chinwelk; *Fr.* Mentagre, Dartre pustuleuse mentagre; *Ger.* Kinnaussatz, Kinnflechten.

This affection scarcely requires to be considered separately from acne. It appears to be produced by obstruction of the follicles of the skin, and consequent inflammation occurring in parts covered with hair; and its principal seats are the chin, in men—*Sycosis menti*; and the head in both sexes, particularly the margin of the hairy scalp, in the occiput, around the forehead and temples, and near the external ear, which is also liable to be included in the disease—*Sycosis capillitii*. (*Plumbe, Mackintosh.*) It is a very troublesome affection, as all eruptions are that implicate the hair.

Treatment.—This does not differ from that recommended in acne. It may require, like it, to be treated both internally and externally. When it is seated on the chin, the use of the razor has to be laid aside, and the beard clipped close, (*Schedel*;) and in severe cases, it is advised not only to employ the point of the lancet as in acne, but the forceps, to extract any hairs which may seem to act as irritants. (*Mackintosh.*)

V. PORRIGO.

SYNON. Favus, Tinea; *Fr.* Les Teignes.

It has been properly remarked, that the difficulties encountered in the study of the pustular diseases of the hairy scalp have been

greatly increased by the descriptions given by Willan and Bateman, under the title of porrigo and porriginous eruptions. (*Schedel*.) They have classed together eruptions under this term, some of which are contagious, and others non-contagious; whilst they have described porrigo as a contagious pustule.

It would appear, that but two,—the *Porrigo lupinosa*, and the *P. scutulata* of those gentlemen,—are contagious; the others,—as the *P. favosa*, *P. larvalis*, *P. decalvans*, and *P. furfurans*, being merely impetiginous or squamous affections of the hairy scalp. (*Biett, Schedel*.)

The two contagious affections alone, therefore, require attention here.

1. The *Porrigo favosa*, (*Biett*,) *Tinea Favus*, *F. dispersus*, *Porrigo lupinosa*, *Tinea favosa*, *T. lupina*, *T. rugosa*, *Ecpye-sis porrigo lupinosa*, *Scabies capitis*; Fr. *Teigne*, *Porrigine*, *Teigne faveuse*; Ger. *Favöse Kopfgrind*, *F. Wachsgrind*, is so called in consequence of the remarkable yellow honey colour of the incrustations. It is characterized by the eruption of small, flat, yellow, umbilicated, deeply seated pustules, distinct or clustered, which soon concrete, and form bright yellow umbilicated incrustations. These incrustations are often traversed by hairs. They increase slowly in size, and the depressions in them become more and more apparent, so that they seem as if forced into the very tissue of the skin.

If attempts are made to remove the scab, pain is excited, and the parts beneath bleed, and appear red and excoriated. The bulbs of the hair inflame; and if the disease persists for any length of time, the hair becomes thin, deprived of its colour, lanuginous, and falls out; after which the surface of the skin may remain smooth and shining, so as to indicate the primitive seat of the eruption. The itching is commonly severe, and, not unfrequently, pediculi breed under the incrustations, and add materially to it.

When the disease has been arrested, the hair grows again,—thin and woolly at first, and is generally weaker and lighter in colour than before; although, in some instances, it has the same appearances as the hair on the sound portions of the scalp.

As in other cases of irritation of the scalp, the lymphatic ganglions in the cervical region are apt to inflame, and abscesses may even form.

The humour, secreted from the affected parts, and which concretes, exhales a peculiar odour, which some have compared to that of the leek, whence the name porrigo, (*porrum*, “a leek;” and others to that of mice. (*Andral*.)

Porrigo favosa appears, occasionally, on other regions besides the scalp; but it is not so loathsome, or intractable a disease under such circumstances. In the opinion of almost all pathologists, the affection is communicable, and is supposed to spread amongst children of the same family, by their using the same comb, hair-brush, towels, night-caps, &c.; yet it is affirmed, that attempts to inoculate

the disease directly, very generally fail; and its contagious character has been denied. (*Alibert.*)

It may attack persons of all ages; but children between six and ten appear to be most liable to it. Where it arises sporadically, it is very difficult to trace the influences that have given occasion to it. Neglect of proper cleanliness; insufficient or improper food; residence in low, damp situations; a scrophulous habit of body, &c., have been enumerated as its occasional causes; but it must be admitted, that the subject is sufficiently obscure. The author has met with a few cases in single members of different respectable families, which have not spread farther, and no light could be thrown upon their origin.

There is generally not much difficulty in discriminating this disease. No other eruption of the scalp, except the next variety—*Porrigo scutulata*—is characterized by minute yellow pustules, whose contents concrete, almost as soon as they are visible, into little cup-shaped or umbilicated scabs.

Treatment.—*Porrigo favosa* is one of the most rebellious affections that can fall under the care of the practitioner; and it rarely or never yields, unless the most sedulous exertions are made use of. The very first step to be taken, in all cases, is to soften the incrustations, so as to enable the appropriate remedies to come in contact with the morbid surface; and the best application for this purpose is a common emollient cataplasm; after which, the matter may be still further softened, if necessary, and washed away by warm milk and water, or soap and water. The Castile soap is best adapted for this purpose;—the yellow or turpentine soap and the soft soap being too irritating. In this way, by alternating the poulticing and washing, all the incrustations may be got rid of in a few days.

The hair must then be cut short with scissors; and the dead hairs be removed—if they do not fall off—by means of the forceps; but no violence should be employed,—least of all, the old depilatory method, which consisted in applying a pitch plaster to the head, and then forcibly tearing off the plaster and the hair along with it. The irritation and pain, caused by this barbarous treatment, was, of course, excessive. When the poultices have softened the incrustations, they may be left off, and an alkaline ointment¹ may be gently rubbed over the parts night and morning; having previously bathed them with a weak alkaline wash,² either tepid or warm.

¹ R.—Potass. carb. ʒj.
Adipis, ʒj.—M.

² R.—Potass. vel sodæ carb. ʒj—ʒij.
Aquæ, Oj.—M.

These alkaline applications would appear to be depilatory. (*Schedel, J. Green.*)

When the irritation has been subdued by this treatment, gentle excitants will commonly be needed to restore the skin to its healthy condition; and when it has persisted for a great length of time, the most powerful applications of an excitant character may be demanded.

The alkaline method of treatment, advised above, appears to have strong testimony in its favour, (*Schedel, Rayer, Biett, Andral*;) but should it lose its influence, a wash of the sulphuret of potassa may be substituted.

R.—Potass. sulphuret. $\mathfrak{z}$ ij.
Aquaë, $\mathfrak{z}$ viiij.—M.

Weak solutions of the chloride of lime,¹ or of the chloride of soda,² or of creasote,³ may also be employed.

¹ R.—Calcis chlorid. $\mathfrak{z}$ ss.
Aquaë, Oj.—M.

² R.—Liquor. sodæ chlorinatæ, p. j.
Aquaë, p. xx.—M.

³ R.—Creasot. $\mathfrak{z}$ ss.
Aquaë, Oj.—M.

A saturated solution of the creasote has been advised, (*Copland*), but the author has found the formula just given sufficiently strong, and when the quantity of creasote has been increased, so much inflammatory irritation has been induced, that it had to be discontinued for a time.

In some cases, solutions of sulphate of zinc,¹ or of sulphate of copper,² or of the nitrate of silver,³ have been of great service; and where the pustules have been few, and scattered here and there, good effects would seem to have resulted from the use of the solid nitrate of silver applied over the affected surfaces, after the incrustations had been removed by the cataplasms and washes.

¹ R.—Zinci sulphat. gr. x.—xx.
Aquaë, $\mathfrak{z}$ j.—M.

² R.—Cupri sulph. gr. v.—x.
Aquaë, $\mathfrak{z}$ j.—M.

³ R.—Argent. nitrat. gr. v.—xx.
Aquaë, $\mathfrak{z}$ j.—M.

A multitude of various ointments have been employed; but they have been regarded by some as inferior to the alkaline unguent before recommended. The citrine ointment, either unmodified, or reduced,¹ has been advised, and may be advantageously alternated with the alkaline ointment.

¹ R.—Ung. hydrarg. nitrat. p. j.
Adipis, p. ij.—iv.—M.

The author's experience with the ointment of iodide of sulphur,¹ is similar to that of a distinguished dermatologist. (*Biett*.)

¹ R.—Sulphur. ioidid. $\mathfrak{z}$ ss.— $\mathfrak{z}$ ss.
Adipis, $\mathfrak{z}$ j.—M.

It has cured some obstinate cases. One of the recommendations, brought forward in its favour, is—that it prevents the formation of fresh pustules, and causes the hair to be reproduced of the same strength and colour as before.

A liniment of the chloride of lime,¹ has been applied successfully by means of a camel's hair pencil, (*Trusen, Roche, Cottureau, Kopp, Ebermeier*), as well as an ointment of the sesqui-iodide of carbon;² a liniment of chlorine water;³ an ointment of creasote;⁴ or of soot;⁵ or of iodine.⁶

- | | |
|--|--|
| ¹ R.—Calcis chlorid. ʒss.
Ceræ albæ, ʒj.
Ol. amygdal. seu oliv. ʒij.—M.
³ R.—Aq. chlorin. ʒj.
Ol. oliv. ʒj.—M.
⁵ R.—Fulig. ʒjss.
Zinci sulphat. ʒvj.
Adipis, ʒiv.—M. | ² R.—Carbon. sesqui-iodid. ʒss.
Cerat. simpl. ʒvj.—M.
⁴ R.—Creasot. ʒss.
Adipis, ʒj.—M.
⁶ R.—Iodin. gr. iij.
Adipis, ʒij.—M. |
|--|--|

The codliver oil—*Oleum jecinoris aselli*—which is presumed to contain iodine,—is said to have proved highly serviceable, applied externally. (*Kopp.*)

Certain of these ointments may be used in alternation; and they must be applied at least six or seven times in the course of the day; premising the use of soap and water to soften the incrustations. It is a cardinal point, indeed, not to permit their existence, and if due care be bestowed on this point, almost any plan of treatment will succeed in the course of two or three months; whilst all will fail, if this be neglected.

In very obstinate cases, cauterization of the morbid surfaces with some dilute acid, passed over the part by means of a feather, is said to have effected a cure. Water must be poured over the part to prevent the action of the caustic from being too deep. Creasote is said to have succeeded, where other means had failed; the diseased parts being touched with a small hair-pencil dipped in the creasote, and the ointment of creasote, advised above, being applied over them.

These are, perhaps, the best of the various topical applications, that have been recommended in this obstinate affection. Constitutional remedies seem to be of little advantage; but attention must always be paid to the general health. An oilskin cap, worn over the head, will tend to prevent the formation of scabs, after the adipous preparations have been employed; but it requires to be repeatedly changed, otherwise more harm than benefit might accrue.

2. The *Porrigo scutulata*, *P. scutellata*, *Favus confertus*, *Tinea capitis vera*, *T. annularis*, *T. maligna*, *T. hereditaria*, *Ringworm of the scalp*; Fr. *Teigne annulaire*; Ger. *Wahre Kopfgrind*, *bösartige Kopfgrind*, *Erbgrind*, is rarely met with in other regions of the body than the forehead and neck. It presents itself in the form of one or more circular red patches, on which numerous minute, deep-seated yellow pustules appear. Like the pustules of *porrigo favosa*, they are usually traversed by a hair, and the eruption is attended with intense itching. The fluid of the pustules usually soon dries up into minute cupped or umbilicated scabs, which adhere by the edges, so as to form a continuous incrustation, of the shape and dimensions of the original patch. Eruptions of pustules subsequently take place on a larger and larger outline, whilst the incrustations fall off from the central parts, and the integument becomes dry, and subject to a constant desquamation. The nutrition of the hair is injured within the circular patches, so that they are all but bald. Portions of the scalp, when

the disease has continued for any time, may exhibit it in different stages; and here and there may be a white shining space entirely bald; the intervening portions of the scalp, between these affected portions, being always covered to a greater or less extent with a branny desquamation.

The disease would seem to be unquestionably contagious, although it may arise, also, spontaneously, like the *porrigo favosa*. It is said to be favoured by poverty and insufficient aliment, and by want of cleanliness; and it is certainly most seen amongst the wretched classes of all countries, although, like the *porrigo favosa*, it occurs, at times, amongst the wealthy, and without any direct communication being traceable.

Treatment.—This is essentially that advised under *porrigo favosa*. First of all, emollient and antiphlogistic applications may be needed, and afterwards the various excitants, directed under *Porrrigo favosa*. The disease is extremely obstinate, and demands the most rigid and prolonged attention.

SECTION V.

PAPULAR AFFECTIONS OF THE SKIN.

SYNON. *Papulæ*; *Fr.* Maladies papuleuses; *Ger.* Papeln, Knötchen.

Papulæ are simple prominences of the skin, which are small, firm and solid, and do not contain any fluid, pass off by resolution, and are often followed by furfuraceous desquamation. They are generally of a chronic character, and may appear upon any region of the body, and most of them are accompanied by intense itching. At times, they are so small, that they have to be detected by passing the finger over the surface, rather than by the eye. Generally, they are not attended by any constitutional disturbance; and none of them are contagious. They are not dangerous, but some of them are extremely rebellious, and the source of excessive discomfort. Many dermatologists reckon three forms of papular diseases—*Strophulus*, *Lichen* and *Prurigo*; but the two first have been thrown together by others, as being mere varieties of the same affection, modified by the different ages of those who labour under it. (*J. Green.*)

I. LICHEN.

SYNON. *Papulæ*, *Papulæ siccæ*, *Pustulæ siccæ*, *Scabies sicca*, *Scabrities*, *Exormia lichen*; *Fr.* Gale sèche, Dartre furfuracée volante, Poussée; *Ger.* Hautmoos, Schwindflecke.

Lichen is a disease of the skin, which is characterized by an eruption of minute *papulæ*, sometimes of a red colour, but more generally differing slightly from the natural colour of the skin, usually agglomerated, or collected in clusters, and attended with much itching. (*Willan.*)

The papulæ, in the most common form of the disease—*Lichen simplex*—are minute, red, often pointed, and scattered irregularly over the part on which they appear. They generally continue with these characters for about a week, when they begin to fade, and end with a slight furfuraceous desquamation. Fresh eruptions, however, usually make their appearance, on the conclusion of their predecessors, and they are commonly ushered in by a painful sense of tingling, or of mingled smarting and itching of the parts, occurring especially when the patient is warm in bed.

Various epithets have been given to lichen, to depict some variety in the seat, appearance and form. Thus, when the papulæ appear to be seated at the roots of the hair, which generally constitutes an obstinate variety, it is termed *Lichen pilaris*. When it occurs on the legs of elderly and debilitated persons, is intermixed with petechiæ, and has a dusky red or livid colour, it is the *Lichen lividus*. When the papulæ, instead of being scattered irregularly, are collected in pretty regular groups, with defined margins, it is the *Lichen circumscriptus*. At times, the papulæ compose a kind of lengthened band, which has been seen extending from the anterior part of the chest to the inner surface of the arm, twisting on itself, until it reached the point of the little finger. (*Schedel*.) This is the *Lichen gyratus*.

The *Lichen urticatus* is another form, in which the papulæ are much larger than in the others, and are elevated, confluent, and inflamed like the stings of nettles. They come out suddenly, and are attended with smarting and distressing itching. The disease is generally seated on the head and face, but it may extend over the trunk and extremities. It appears chiefly in spring, and during the heat of summer; and children, young persons and females, are said to be most liable to it. It is sometimes attended by febrile phenomena.

The *Lichen strophulus*, *Exormia strophulus*, *Strophulus*, *Licheniasis strophulus*, *Exanthema strophulus*, *Ebullitio*, *Tooth rash*, *Gum* or *Gown*, *Milk spots*; Ger. *Schälknötchen*, *Zahnausschlag*, is very common in infants at the breast. It presents considerable diversity in its appearance, and all the forms are seen, at times, on the same child. When the papulæ are red, inflamed and prominent, scattered here and there, and intermixed with erythematous patches, it is the *Strophulus intertinctus* of dermatologists, *Red gum* or *Red gown*, Ger. *Häutelblätterchen*. In some cases, they are smaller, or of different sizes, crowding in clusters, and in more extensive crops—the *Strophulus confertus* or *rank red gum*; and, in others, the eruption appears in little circular clusters, somewhat solitary, and generally on each arm or cheek; more commonly, however, flying from part to part—the *Lichen volaticus*. Sometimes, the papulæ are minute, hard, and of a whitish colour, surrounded occasionally by a reddish halo—the *Strophulus albidus*, or *white gum*:—or the pimples are large, glabrous, shining,

of a lighter hue than the skin, and without a halo or blush—the *Strophulus candidus*, Ger. *Glanzknötchen*.

The *Lichen agrius*, *Exormia lichen ferus*, *Papula agria*, as the name imports, is a more severe form of the disease, and is characterised by groups of red and inflamed papulæ, united in considerable number, accompanied with intense itching, which scratching augments to an almost intolerable degree. Towards the fourth or fifth day, the inflammation increases; the tips of the papulæ become slightly ulcerated, and a sero-purulent fluid is discharged, which, by concreting on the surface, forms small yellowish, prominent, rough incrustations: these, when detached, are replaced by thin scaly scabs. The local inflammation gradually disappears in from ten to fifteen days. In some cases, however, the discharge continues; other incrustations are formed, and again replaced, and the disease may continue in this form for weeks, or it may become chronic, and persist for months. (*Schedel*.)

This form of lichen, which is perhaps nothing more than one or other of the varieties of lichen—especially the lichen simplex and the lichen circumscriptus—in its most aggravated form, (*Green*,) appears frequently on the face, and is rarely general. It occurs most commonly in summer. The heat of the sun is a common excitant of lichen in hot, and even in the more temperate climates, during the summer season. The affection, induced in this manner, is the *Lichen tropicus* or *prickly heat*; so called from the feeling of pointed bodies running into the skin when the patient moves.

Persons who leave a country of lower temperature, and pass to one in which the heats of summer are excessive, rarely fail to suffer greatly from this inconvenient eruption.

An attention to the elementary or papular form of the eruption will generally be sufficient to prevent errors of diagnosis. It must be borne in mind, however, that pustular or vesicular eruptions may exist along with it.

Treatment.—It is not easy to account for the appearance of those eruptions. Some of the causes, as in the lichen tropicus, are sufficiently manifest. The lichen strophulus, too, is probably connected with the irritation of dentition in some cases, and disorder of the stomach and bowels; but in other cases, neither this nor most of the other forms of lichen can be readily accounted for.

The cases of lichen strophulus, that occur in infants, receive generally but little attention. It is commonly sufficient to administer to the child an occasional dose of rhubarb and magnesia. The cause of the eruption is generally transient; and, as it passes off, the disease disappears also.

Acute lichen generally requires nothing more than the antiphlogistic treatment, and tepid baths; with a few alkaline baths, (see page 166,) towards the disappearance of the eruption, or when the itching is very troublesome. (*Schedel*.) In lichen agrius, active measures may be needed to reduce the excitement,—as bleeding,

tepid baths, emollient applications, and cathartics; and in the chronic form, after the excitement has been subdued, the same plan of treatment may be necessary as in eczema.

II. PRURIGO.

SYNON. Cnesmos, Scabies papuliformis, Pruritus, Exormia prurigo.

This disease is characterized by small distinct papulæ, without change of colour in the skin, which are most commonly restricted to the outer surface of the limbs and trunk. The eruption is attended with intolerable itching, and this causes the patient to scratch off the tops of the pimples, which become covered with small black crusts of concrete blood.

The affection is not communicable: it is almost always chronic, lasting for months and years.

Three varieties are commonly reckoned:

1. The *Prurigo mitis*. This, as its name imports, is the mildest form. The pimples are very minute,—so minute, that they do not seem to explain the itching that accompanies them. This is always considerable, but not usually constant, and it is aggravated by stimuli, and by the heat of bed.

2. The *Prurigo formicans* is so called from the sense of formication which attends it. The papulæ are here larger and more prominent, and the itching is more intolerable. This variety is more obstinate than the last; for although it may disappear in a few weeks, it is apt to recur for months, and even years.

3. The *Prurigo senilis*—as its name imports—occurs in the aged, but is not confined to them. It is met with, also, in children of weakly constitution, and is, in all cases, a most obstinate disease; sometimes, indeed, resisting every remedial agency.

The different forms of prurigo are not unfrequently complicated by various other vesicular, pustular, and sometimes even furuncular inflammations. The skin is then deeply inflamed, chapped in many places, and in others greatly thickened. The whole surface, too, when the disease has continued long, almost uniformly becomes affected with an abundant furfuraceous desquamation. Under such circumstances, the general health is apt to suffer; the rest is disturbed, and the constitution fatigued by constant irritation. It is then, also, that the disease is apt to be complicated by the presence of pediculi, which, if no care be taken to prevent them, may swarm in countless multitudes, and give to this form the name *prurigo pedicularis*. The facility with which the insects are reproduced and multiply, is sometimes a matter of astonishment. (*Schedel.*)

Several forms of partial prurigo are admitted by writers, although papulæ are not always discovered;—for example:—1. The *Prurigo podicis*, which has all the characters of the P. formicans aggravated if possible; although the eruption extends no farther than the parts around the anus, and the cleft between the nates, and which is a very intractable form. 2. The *Prurigo genitalium* may affect the scrotum in males—*Prurigo scroti*; and the pudendum in females—*Prurigo pudendi* seu *pudendorum*. It is a most distressing ma-

lady; and, in the female, may give occasion to nymphomania. *Prurigo præputii* is a variety of the same.

Prurigo is most likely to be confounded with scabies; but scabies is a vesicular disease, and is generally seen on the inside of the limbs at the flexures of the joints, whilst prurigo is commonly found on the back, shoulders, and external surface of the limbs.

Causes.—The two extremes of life would appear to be most liable to prurigo; and its development is said to be favoured by want of cleanliness, defective nourishment, and an excitant regimen. It rages most, too, in hot and variable seasons. (*Andral*.) Still, as in the case of other cutaneous affections, the causes are generally sufficiently obscure.

Treatment.—The milder cases of prurigo may be treated by spare diet, the occasional use of a gentle laxative,¹ and prolonged immersion in a warm bath, or in a weak alkaline or sulphureous bath.

¹ R.—Pulv. rhei, gr. x.
Magnesiæ, gr. xv.
Ol. carui, gtt. iij.—M.

Should the symptoms indicate it, blood-letting may be necessary, and a more rigid adoption of the antiphlogistic treatment.

When all signs of febrile excitement have passed away, and the disease still continues; or if it makes its appearance in those of advanced life, and under conditions of misery and bad diet, the regimen and system of medication should be strengthening. Ointments of opium,¹ and lotions of the cyanide of potassium,² or the hydrocyanic acid,³ or simple mucilaginous decoctions or infusions, —as of the mallow, benne, slippery elm, &c.,—may be applied to relieve the itching.

¹ R.—Opii, ʒj.
Adipis, ʒj.—M.

² R.—Potass. cyanur. gr. xij.
Mist. amygdal. ʒvj.—M.

³ R.—Acid. hydrocyan. dil. ʒj.—ʒiv.
Decoct. malvæ, Oj.—M.

In very obstinate cases, the sulphurous water baths, and the sulphur fume baths, may be employed; and sulphur, alone or combined with cream of tartar, may be given internally.

R.—Sulphur. gr. x.
Potassæ bitart. gr. xv.—f. pulv. ter die sumend.

In prurigo pedicularis, the fumes of cinnabar are said to destroy the pediculi in a very short period. (*Schedel*.) The unguentum hydrargyri ammoniati effects a similar good purpose. In the prurigo podicis and prurigo genitalium, the parts should be bathed with cold water; and cold mucilaginous lotions, like those before recommended, with narcotic washes or ointments, should be applied;—afterwards, the alkaline and sulphurous water baths are the best local applications. Occasionally, good effects are derived from the use of the yellow-wash,¹ or the unguentum hydrargyri nitratis properly reduced.²

¹ R.—Hydrarg. chlorid. corros. gr. j.—ijj.
Aquæ calcis, ʒj.—M.

² R.—Ung. hydrarg. nitratis. p. j.
Adipis, p. iv.—M.

A recent writer (*Prus*) affirms, that he has often succeeded in the treatment of prurigo, in old men, by lotions of the corrosive muriate of mercury, applied night and morning over all the parts where the papulæ exist.

R.—Hydrargyr. muriat. corrosiv.

Ammoniæ muriat. āā ʒj.

Aquæ, Oss.—M.

The same solution has been employed with benefit in the pruritus of the internal surface of the labia pudendi, which occurs occasionally in females in the decline of life, and is exceedingly obstinate. (*Duparcque*.)

A recent writer on cutaneous diseases, (*J. Green*), remarks, that when patients have been lowered by abstinence, and the exhibition of a few doses of purgative medicine, he always recommends the vapour bath to be tried at a low temperature at first; and if, to the temporary excitement, which immediately follows the use of this remedy, an abatement of the symptoms succeeds, as usually happens, he then knows, that he can command the disease. “I have even observed,” he adds, “that the more inveterate the affection appeared to be,—the more severely the parts affected were excoriated, the more they were complicated with discharging sero-purulent eruptions, the more certainly were they amended and ultimately cured by perseverance in the use, first of the vapour, and then of the hot air, and sulphur fume, bath. Under the use of these means, the thickening of the skin, and œdematous state of the subcutaneous cellular membrane are very speedily dissipated, and the withered, dry, and unperspiring surface rendered sleek and velvety to the touch, as it is in health.”

SECTION VI.

SQUAMOUS AFFECTIONS OF THE SKIN.

SYNON. Squamæ; *Fr.* Maladies squameuses; *Ger.* Schuppen, Schuppigen Hautkrankheiten.

Under squamous diseases of the skin are usually classed certain chronic eruptions, which are characterized by the occurrence of a greater or less number of red spots or patches, that soon become covered with scales, or lamellæ of the cuticle, altered in its general appearance and texture. There is not, in this division of cutaneous affections, an elementary form to which the disease can be referred, as in the case of the exanthematous, vesicular and other eruptions; the squamæ or scales are really the product of a morbid state of the skin, which differs in its character in the different affections, so as to give rise to the appearance of the epidermoid exudation, which they respectively present. In many of the cutaneous affections, that have already engaged attention, incrustations have been spoken

of, but they have been owing to the desiccation of fluids that have been contained in vesicles or pustules. The scales—in the diseases now to be considered—are portions of the epidermis, altered in its qualities, and hence the different squamous affections have been classed by a distinguished pathologist, (*Andral*), under “Diseases of the skin, characterized by a lesion of secretion.”

The number of squamous diseases, so classed, is not more than four,—*Lepra*, *Psoriasis*, *Pityriasis* and *Ichthyosis*. The two first are considered by some as modifications of one and the same disease, and they certainly occur very frequently at the same time in the same subject.

The squamous diseases are generally attended with but little constitutional disturbance; nor do they commonly give occasion to much local inconvenience, until they have existed so long that the integuments of the parts affected become indurated and thickened. They are none of them contagious or attended with danger, but they are unsightly, and therefore the occasion of much uneasiness, especially as they are not readily removed by any mode of treatment.

I. LEPRA.

SYNON. *Lepidosis lepriasis*, *Vitiligo*, *Lepra Græcorum*, *Herpes furfuraceus circinnatus*, *Leprosy*; *Fr.* *Lèpre*, *Dartre furfuracée arrondie*; *Ger.* *Aussatz*.

Lepra is characterized by scaly patches, of a roundish shape, arranged in circles or rings, commonly circumscribing a space in which the skin preserves its integrity.

The *Lepra vulgaris*—*Psoriasis circinnata* of some—occurs in the form of distinct, circular, scaly patches, with raised circumferences and depressed centres, sometimes intermixing, so as to form a continuous scaly surface. It may occur on any part of the body, but is more frequently met with on the limbs, and near the points, especially the knees and elbows. It begins, at first, by small scaly patches, which spread, retaining their circular shape; the scales, too, become thicker, especially at the margins of the patches, which, therefore, appear elevated. The centre becomes free as the circle enlarges, and it commonly remains so, except in rare cases, in which the scales accumulate over the surface, and form thick prominent crusts. When the patches are very large, their circular raised borders are covered with thick, adherent, white scales, whilst the centre appears depressed and healthy.

As the patches augment in dimension, the eruption spreads on the abdomen, shoulders, back, chest, and sometimes on the scalp and forehead; seldom on the face and hands.

The progress of this affection is always slow, often remaining for many years. When it disappears, the rings break, the elevations sink and grow paler, and finally disappear, when the skin resumes its healthy state. It is usually by no means a serious affection, and rarely gives occasion to any marked derangement of health.

Causes.—The causes of lepra are involved in the same obscurity as those of chronic cutaneous diseases in general. It is met with amongst the poorer classes of all countries, but is more frequent and severe in warm climates, and is not confined to the poor, but is said to attack those frequently who have gouty constitutions. A modern writer (*Mackintosh*) remarks, that for many years past, he has paid considerable attention to disorders of the skin, and a great many cases of lepra and psoriasis have fallen under his observation: in all the cases but one, gastro-intestinal irritation was discovered, and in that one, there was great mental anxiety, with despondency, and hepatic derangement. Still, this remark leaves us equally in the dark; for although gastro-intestinal irritation is extremely common amongst us, lepra is rare. The causes, that give rise to the peculiar phlegmasia of the skin, remain to be appreciated.

Treatment.—This is so identical with that for psoriasis, that it may be appropriately considered under the latter head.

II. PSORIASIS.

SYNON. Serpigo, Serpigo, Scabies sicca, Scabies ferina, Psora leprosa, Lepidosis psoriasis, Impetigo, (of some,) Psora squamosa, Dry scall, Scaly tetter, Small dry scall; *Fr.* Dartre écaillée, *D.* squammeuse; *Ger.* Räude.

Psoriasis is characterized by slightly raised red patches, of various extent and shape, which are generally covered with whitish, laminated, dry scales, of different thickness;—the characters, which distinguish lepra vulgaris from psoriasis, consisting chiefly in the shape of the patches, which is circular in the former; of irregular outline in the latter disease. (*Schedel.*)

In the most simple form, psoriasis appears in the shape of small, red, distinct elevations, of the size of large pin-heads, which speedily become covered, on their tops, with thin, dry, white scales. These little raised spots enlarge gradually, but not very evenly; and, whilst they are on the increase, always continue more elevated in the centre than around the circumference; it is only when they begin to go off, that they appear depressed in the middle;—the patches of psoriasis, like those of lepra, getting well chiefly from the centre towards the circumference. The patches, at their height, are not more than about one-fourth of an inch in diameter, and being covered with somewhat translucent and rather opalescent scales, they look very much like large drops of liquid, adhering to the surface of the region upon which they are formed, whence the term *Psoriasis guttata*—the *P. discreta*. (*Rayer.*)

The scales, when detached, are readily renewed, and the surface they covered appears highly inflamed, and somewhat raised above the level of the surrounding skin. They are, likewise, the seat of considerable pain, when the scales are removed.

In the *Psoriasis diffusa*, *P. confluens*—the *Dartre squammeuse lichénöide* of Alibert—the skin is covered with much larger patches, of irregular shape, which, by their union, cover, at times, the whole anterior surface of the leg from the instep to the knee,

or the whole extent of the posterior surface of the forearm,—the elbows and knees being seldom free. On these parts the disease disappears slowly. Beneath the scales, the surface is very red, and extremely tender, accompanied by a sensation of burning and severe itching, and often by painful fissures and chaps. It commonly attacks adults, but is met with, also, in infants—*Psoriasis infantilis*,—and is attended, at times, with slight constitutional disturbance. (*Schedel.*)

The *Psoriasis gyrata* is a very rare form of the disease, in which the eruption appears generally on the back or shoulders, in a spiral or serpentine form.

These are the chief forms; for the *Psoriasis inveterata* is but a more obstinate form of psoriasis, occurring most frequently in aged individuals, and in broken down constitutions. The parts of the skin, which are the seat of the affection, are thickened, hard, and unyielding; and the surface is red, chapped, rough, and uneven. The scales are no longer thick, and of large size; but a sort of furfuraceous desquamation supervenes, which fills up the furrows and is readily detached. When these patches surround the joints, they are intersected with deep, bleeding, and always very painful fissures. This inveterate form of psoriasis is most frequently seen on the limbs, and it extends even to the roots of the nails, (*Psoriasis unguium*,) which become misshapen, rough, and ragged; split, and are replaced by others more like friable scales than nails. (*Bielt.*)

Various forms of partial psoriasis have been designated by dermatologists. For example, the genital organs of both sexes may be implicated. In man, it may attack the prepuce—*Psoriasis præputialis*,—or the scrotum—*Psoriasis scrotalis*; and, in women, the labia majora. The parts, in such cases, are generally thickened and fissured, bleeding when stretched, and covered with thin, light scales. The *psoriasis ophthalmica* appears in the form of little squamous patches about the angles of the eyes, and over the eyelids, which are tense, painful, itchy, and impeded in their motions. When the disease is obstinate, the conjunctiva is sometimes inflamed.

One of the most interesting forms of partial psoriasis, is the *Psoriasis palmaris* seu *palmaria*, commonly called the *Grocer's itch*, and the *Baker's itch*, which, as the epithet *palmaris* imports, begins on the palms of the hands, in the form of one or more red, slightly raised, hard spots, which are soon covered on their tops with little dry, white scales: these, on falling off, are replaced. The circumference of the patch gradually augments, until the whole hand is affected. Frequently, the affected parts to the tips of the fingers become hard, stiff, and dry; the hand remains in a state of *semiflexion*, and cannot be opened without great pain; the lines, naturally observed on the palm, are greatly increased in depth, and the spaces between them are covered with thick laminated scales. In protracted cases of the disease, these lines change into fissures, which bleed, whenever attempts are made to use the hand. The

parts are always highly inflamed, and in general acutely sensible. (*J. Green, Schedel.*)

Psoriasis also attacks, at times, the backs of the hands chiefly; and both this and the psoriasis palmaris are frequently seen in grocers, bakers, dyers, washerwomen, smiths, and in those of other occupations in which excitants are applied to the hands.

Except in these cases, the causes are exceedingly obscure. It certainly is not contagious; but a disposition to it would appear to be transmissible from progenitors. It occurs in all seasons, but more particularly, it is said, in the spring and autumn, (*Rayer*), and attacks individuals in every class of society, although it is more frequent amongst those who live in the midst of filth and wretchedness. (*J. Green.*)

Treatment.—In the treatment of lepra and psoriasis, great patience and perseverance are demanded. The most manageable form of psoriasis is the *P. guttata*; but in whatever shape these cutaneous affections occur, attention must be paid to the accompanying condition of the system, and to the appearance of the eruption. Should the disease be of recent date, and attended with considerable inflammation, and uneasy sensations in the patches, general blood-letting, and cathartics, with the whole antiphlogistic regimen, may be needed, and the parts themselves should be bathed with emollients of various kinds,—as flaxseed infusion, or some tepid gelatinous fluid; or they may be anointed with cream or hog's lard, or the codliver oil—*Oleum jecinoris aselli*. A strict regimen and rest should also be enjoined. On the other hand, where the frame is debilitated, the constitution broken down, and no manifest signs of inflammation accompany the eruption, gentle tonics, with change of air, and nourishing diet, so as to improve the general health, may be essential.

In very few cases of either lepra or psoriasis does the external treatment alone suffice. The disease can rarely be broken in upon, except by acting in two ways on the morbid condition of the system of nutrition of the skin,—that is, by external agents assiduously applied to the eruption, and by internal remedies, which may modify the condition of the circulating fluid, and, through it, that of the morbid tissues.

The topical applications, which have been advised, have been numerous and varied; indeed, it has been properly remarked, (*Bielt, Schedel*), that it is almost impossible to judge, *à priori*, what remedies will be most advantageous, and often the various therapeutical agents we possess must be tried in succession, before the right one is discovered.

Of the external agents that have been advised, it would be difficult and unprofitable to make a catalogue. It will be sufficient to indicate the most prominent, and such as are chiefly in use at the present day. It is proper, however, to premise, that when the affection covers a large surface, it is not easy, nor is it, in the case

of certain of the applications, proper to cover the whole of the affected parts with them.

Several of the preparations of mercury have entered into the different unguents, &c. The citrine ointment—*Unguentum hydrargyri nitratis*—and the white precipitate ointment—*Unguentum hydrargyri ammoniati*—properly regulated in regard to strength; the ointment of the protiodide of mercury;¹ or a liniment of the deutiodide;² or an ointment of the same;³ or the liquor hydriodatis arsenici et hydrargyri diluted with an equal portion of water, or farther, should it be advisable. (*Donovan*.—See the author's *New Remedies*, 3d edit., p. 288: Philad. 1841.)

¹ R.—Hydrarg. protiodid. ʒj.

Adipis, ʒj.—M.

To be rubbed on the parts affected, night and morning.

² R. Hydrarg. deutiodid, ʒj.

Olei amygd. ʒj.—M.

The parts to be pencilled with it, three or four times a day.

³ R.—Hydrarg. deutiodid. gr. xv.

Adipis, ʒij.

Ol. limon. gtt. x.—M.

The tar ointment—*Unguentum picis liquidæ*—the ointment of creasote;¹ or a liniment of the same;² an ointment of the sesquiodide of carbon;³ or of the iodide of ammonium;⁴ or of the iodide of sulphur.⁵

¹ R.—Creasot. ʒss.

Adipis, ʒj.—M.

² R.—Creasot. gtt. v—xx.

Olei olivæ, ʒss.—M.

³ R.—Carbon sesqui-iodid. ʒss.

Cerat. simpl. ʒvj.—M.

⁴ R.—Ammon. iodid. ʒj.—ʒj.

Adipis, ʒj.—M.

⁵ R.—Sulphur iodid. ʒj.—ʒss.

Adipis, ʒj.—M.

It has been advised, also, that the patches should be touched with a liniment composed of olive oil and rose water, each one ounce; liquor potassæ, half an ounce; and when they are small, as in psoriasis guttata, they may sometimes be touched advantageously with strong acetic acid, or aromatic vinegar, or the mineral acids, more or less diluted, (*Schedel*); but care, it need scarcely be added, must be used in the employment of these potent agents, and they never can be proper in the early and inflammatory stage.

As auxiliaries, various baths of a more or less exciting character have likewise been prescribed, and, at times, with advantage:—for example, the vapour and hot air baths, the alkaline and sulphurous liquid baths, and the sulphur fume bath. Chlorine fumigations have also been used in these affections, as well as in scabies, and they have proved useful, but generally, fumigations of sulphurous acid are employed by preference, in consequence of the greater facility with which they can be prepared.

In long protracted and inveterate cases, various internal remedies have been advised, in conjunction with one or other of the external agents just enumerated. Many of these, it is probable, are inert,—for example, the decoction of dulcamara; and, in the author's opinion, the infusion, decoction, and extract of sarsaparilla,

respecting the virtues of which so much discordance still exists. The great object—as already remarked—is to modify the condition of the circulating fluids, and, through them, to act upon the tissue whose nutrition is morbidly affected. None of the agents, just mentioned, have probably any such power, unless they are given in the form of syrup; and, in this case, they are indebted to the saccharine matter for their virtues. These cutaneous affections are cases in which syrup, administered in the form often advised, ought to form a part of the treatment; and it is easy to give many of our remedial means in it.

Amongst the most valuable of these are the preparations of arsenic;—the liquor arsenitis potassæ, the liquor arseniatis sodæ; the iodide of arsenic, as advised under Ecthyma and Impetigo; or the iodide of arsenic and mercury,¹ as recently administered with advantage in Ireland. (*Donovan, Carmichael, A. Colles, Croker, Graves, Irvine, Cusack.*)

¹ R.—Liquor. hydriod. arsenic. et hydrargyri, ʒij.

Aquæ destillat. ʒiiiss.

Syrup. zingib. ʒss.—M.

A fourth part to be taken night and morning.

Great advantage has, likewise, been derived (*Bielt*) from the use of the arseniate of ammonia.

R.—Ammon. arseniat. gr. j.

Aquæ destillat. ʒj.—M.

Dose, twenty to twenty-five drops in the day; gradually increasing it to a drachm or more in the 24 hours.

In all these cases, the remedy may be administered in a wineglassful of simple syrup, and this may be taken between the meals, so as not to be interfered with by digestion.

The tincture of cantharides has been much prescribed by some practitioners, (gtt. iv.—vj, bis die, ex infuso lini;) but it is liable to excite great irritation in the urinary organs; the revulsive effect of which, by the way, may be the mode in which the cantharides acts beneficially, if it ever does so. It is not much used in this country, and is probably one of the numerous agents, that have been suggested empirically in this and other inveterate maladies.

A thorough change of the system of diet to which the patient has been accustomed, as well as of all the influences surrounding him, by travelling, is advisable, wherever this is practicable; and a visit to the sulphurous springs, with the internal and external use of the waters, has, at times, effected a cure in very rebellious cases.

III. PITYRIASIS.

SYNON. Pithyriasis, Pityrisma, Herpes furfuraceus, H. farinosus, Furfuratio, Lepidosis Pityriasis, Dandriff; *Fr.* Dartre furfuracée volante; *Ger.* Hautkleie, Kleiengrind, kienartige, mehlige, einfache Flechte.

This affection, as its name imports, is characterized by a kind of branny (*πικρὸν*, “bran”) exfoliation of the cuticle; most commonly seated in the parts that are covered with hair, and especially in the

scalp. The exfoliation is, commonly, preceded by a slight reddish colour of the integument. Four varieties have been admitted by the generality of dermatologists.

The *pityriasis capitis*—so called from its appearing on the head—is chiefly seen in childhood, and is indicated by slight itching, and the copious furfuraceous desquamation that supervenes on scratching. The *pityriasis rubra* is so called from its appearing in small, light red spots, which gradually extend, coalesce, and form large continuous surfaces, covered with a branny desquamation, under which the epidermis appears of a dull crimson red colour. It is not a common variety.

When any part of the surface is affected with a variegated discoloration of the epidermis, the variety is termed *pityriasis versicolor*. It may occur on any part of the body, but is generally seen on the breast, epigastrium, and other parts that are covered.

Lastly, a form of the disease, termed *pityriasis nigra*, was observed frequently during the prevalence of an epidemic Acrodynia, (q. v.) which existed in Paris in the years 1828 and 1829. The disease, treated of by Bateman under the name *pityriasis nigra*, is not accompanied by any desquamation, and consequently does not belong to the squamous phlegmasiæ of the skin. It has been classed by other dermatologists under the *Dischroa* or *Maculæ*.

Causes.—These are very obscure. The general health is rarely concerned. In the absence of better reasons, the affection has been ascribed to want of proper cleanliness. The *pityriasis rubra* has been traced—it is affirmed—to exposure to the sun's rays; to the use of exciting drinks; particular articles of diet, as mushrooms, &c.; but it must be admitted that the etiology is involved in darkness.

Treatment.—When the dandriff occurs in children, it can be removed by due attention to cleanliness, and the constant use of a soft brush. The idea, that a hard comb is advisable is pernicious. When the disease is obstinate, and to a great extent, some of the milder ointments or alkaline washes, recommended under *Psoriasis*, may be found serviceable. The use of sulphurous lotions, and of sulphur or the sulphuret of potassa internally, has been found efficacious. The iodide of sulphur makes an excellent ointment in this as in various other chronic cutaneous diseases. When *pityriasis* does not yield to these external applications, recourse may be had to the combined employment, internally, of the preparations of arsenic and the other therapeutical agents, recommended under the last head.

IV. ICHTHYOSIS.

SYNON. *Lepidosis ichthyiasis*, *Lepra ichthyosis*, Fish-skin, Fish-skin disease; *Fr.* *Ichthyose*; *Ger.* *Fischschuppenausschlag*, *Fischhaut*.

Ichthyosis is characterized by a morbid condition of the cuticle, which appears thickened, split into square and irregular compartments of different shapes and dimensions, of a dirty grayish,

greenish, or brownish colour, and resting upon a surface which is never inflamed, and from which it does not exfoliate as in psoriasis. Andral remarks, that if there be any disease, unconnected with the inflammatory element, it is ichthyosis.

As the disease advances, the cuticle often becomes greatly inspissated, having been seen little short of half an inch thick in some cases. Yet the epidermis, in its sensible or chemical properties, does not seem to differ from the healthy state. Instead, also, of appearing mechanically divided, or cracked into angular pieces, as it usually does, the cuticle is sometimes produced in the form of pointed prolongations, as if it had been moulded on the papillæ, like the shorter and blunter quills of the porcupine. Hence, persons so formed, have been termed *porcupine men*. (*J. Green.*)

The diagnosis of this affection is not difficult. There is an absence of all vesicular, pustular, papular and squamous characters, and it would seem to be almost always congenital, or to appear not long after birth.

Treatment.—Not much can be done where the disease is general. Frequent bathing, and a due attention to cleanliness are indispensable. In this way, the altered cuticle may be detached, but it is, in general, speedily reproduced. It may be proper to alter the morbid condition of the skin, in partial ichthyosis, by the remedies, internal and external, advised under Psoriasis; and benefit is asserted to have been derived from the application of blisters to the part, (*Bielt*;) but it must be admitted, that the affection is too often rebellious to the best devised treatment.

SECTION VII.

TUBERCULOUS AFFECTIONS OF THE SKIN.

SYNON. Tubercula; *Fr.* Maladies tuberculeuses; *Ger.* Knoten.

It has been elsewhere remarked as unfortunate, that the term "tubercle" has been employed in pathology with two significations; the one comprising those heterologous formations, which occur in the constitutional disease of tuberculosis, and which have been described in the early part of this work; and the other embracing affections of the skin, that are characterized by small, primary, solid, circumscribed, and enduring tumours, of various sizes, developed in the substance of the integuments, the tendency of which is, at times, to partial suppuration at the summit, or ulceration of an obstinate and generally destructive kind. (*Schedel.*)

The class includes some formidable affections, which, fortunately, in this country, are not of usual occurrence. Some of them, too, fall almost entirely under the charge of the surgeon, and, therefore, do not demand consideration here.

The diseases, that belong to this division, are,—Lupus, Elephantiasis Græcorum, Frambœsia, Molluscum, and Cancer.

I. LUPUS.

SYNON. Lupus vorax, L. herpeticus, Herpes exedens, H. phagedænicus, H. esthiomenos, H. ferus, H. depascens, Formica corrosiva; *Fr.* Dartre rongeante, Esthiomène, Esthiomène; *Ger.* Fressender, offener Krebs, fressende Flechte.

This tuberculous affection is most commonly seated in the face, and is characterized by the development of broad, flattened tubercles, of a dark red colour, which open sooner or later, and are converted into spreading ulcerations covered with incrustations.

According to the various aspects it assumes at the commencement, the affection has been divided into three varieties. 1. That in which continuous surfaces are destroyed, the *Exfoliative lupus*; (*Blasius*.) 2. That which destroys in depth, the *Ulcerative lupus*, (*Blasius*); and 3, That which is attended with hypertrophy of the diseased surfaces; the *Hypertrophied lupus*; *Ger.* *Hypertrophische lupus*. (*Blasius*.)

The first variety, in which continuous surfaces are destroyed, is not unfrequently seen. It occurs most commonly on the cheeks, and appears to destroy the superficial layers of the skin only.

In the simplest case, there is no tubercle or incrustation, but a slight desquamation occurs, which leaves the surface of the skin beneath red and shining. When the disease stops, the desquamation ceases, but the surface always remains thin and shining, as if it had been seared by a red hot iron. In cases of somewhat greater severity, small tubercles form; which may remain quiescent for a longer or shorter period, but ultimately coalesce, and ulcerate at their summits; so as to form thick incrustations, of which the author has recently had a case under his care, which yielded to the creasote ointment. In other cases, however, of still more severity, the tubercles become the seat of irritation; their number augments, the intervening spaces appear swelled and œdematous, and the disease slowly extends over the whole face, destroying the nose.

This variety may occur, likewise, in large continuous patches on the chest, the anterior part of the thighs, and other portions of the extremities.

2. The variety of lupus, that destroys the parts in depth, commences with one or more small tubercles, on the alæ or tip of the nose, which are smooth, soft and dusky-coloured. These may remain indolent for a time, after which they form deep ulcerations, which sometimes destroy the soft cartilaginous parts of the nose. The ulceration begins, at times, in the mucous membrane of the nose, and the cartilaginous septum may be destroyed before any ulceration has taken place externally. (*Schedel*.) It has been seen, too, penetrating the nasal fossæ, returning by the roof of the mouth and gums, and destroying all the parts more or less.

3. The lupus attended with hypertrophy is analogous in the shape of the eruption to elephantiasis. (*Andral*.) It is always confined to the face, where it appears in soft, slightly prominent and indolent tubercles, which are developed simultaneously over

a considerable extent of surface. In this variety, ulceration does not often take place at the summits of the tubercles; but their bases enlarge; and the integument between them becomes hypertrophied, so that, ultimately, the spaces between them are filled up, and the face becomes hideously enlarged.

These three varieties may exist at the same time. Large portions of the lips and of the eyelids are sometimes destroyed, and the conjunctiva is attacked with chronic inflammation, which, in some cases, induces blindness. (*Schedel.*)

It has been remarked, that the cure of this affection is singularly influenced by the occurrence of erysipelas, doubtless by the new action in the vessels of the cutaneous envelope. A writer of eminence, (*Andral*), affirms, indeed, that the presence of erysipelas is the most favourable condition for the cure of lupus; and he suggests, that it would be advantageous if we could induce erysipelas artificially in such cases.

Young persons are more liable to it than adults; if we except, perhaps, the first variety, described above, which the author has seen more frequently in adults. It is affirmed to be rare after the age of forty. (*Andral, Most.*) Of its causes we know nothing, but the scrophulous temperament would appear to give a predisposition to it. It has been seen, however, in those in whom scrophula could not be suspected.

It is asserted, by some, to have been met with more frequently in the country than in towns; which has been ascribed to the inhabitants of the former eating cheese and salt provisions, (*Andral*;) but, in the first place, the fact is by no means established, and were it so, the explanation does not appear to be satisfactory.

Treatment.—As the disease seems to be connected with a vicious condition of the nutritive functions, it is important to inquire into the nature of this *vice*, and to treat it accordingly. Generally, it will be advisable to have recourse to the various internal remedies recommended for scrophulosis—as the preparations of iodine, either alone or in combination with mercury or arsenic, or both. The deutiodide has been found especially beneficial. (*Blasius, J. W. Schmidt, jun. of New York.*)

R.—Hydrarg. deutiodid. gr. v.
Micæ panis,
Pulv. sacchar. alb. āā q. s. ut
fiant. pil. lx.

Dose, two, morning and evening.

Or,
R.—Hydrarg. deutiodid. ℥j.
Alcohol, ℥iss.—M.

Dose, ten to twenty drops, in a glass of water.

Recently, the iodide of mercury and arsenic has been greatly extolled. (*Donovan, Carmichael.*—See the author's *New Remedies*, 3d edit. p. 287, Philada. 1841.)

Chalybeates—as the ferri carbonas præcipitatus—have likewise been found of decided benefit. (*C. Key.*)

External remedies have generally been most trusted to. The protiodide¹ and deutiodide of mercury,² creasote,³ or iodide of sulphur,⁴ rubbed on the tubercles, or on the incrustations, six or eight

times a day, washing the parts, first of all, with warm soap and water, have been found very serviceable.

¹ R.—Hydrarg. protiodid. ℥j—℥ss.
Adipis, ℥j.—M.

² R.—Hydrarg. deutiodid. gr. xij.
—℥ss.

Adipis, ℥j.—M.

³ R.—Creasot. f. ℥ss.

Adipis, ℥j.—M.

⁴ R.—Sulphur. iodid. ℥j.—℥ss.

Adipis, ℥j.—M.

In a recent case of the first variety of lupus, the author succeeded in arresting the disease entirely by the use of the creasote ointment, applied assiduously with ten drops of Lugol's solution, taken three times a day, internally. A recent writer, (*John Davies*), asserts, that in lupus or *noli me tangere*, the strong tincture of iodine laid upon the ulcerated surface has cured the disease without the use of internal remedies.

The cod-liver oil may also be used in alternation with any of the ointments prescribed above.

The application of caustics is had recourse to by many. Before so doing, it is well to premise the use of emollient cataplasms to remove the incrustations. The caustics used are the acid nitrate of mercury, and the chloride of antimony. Occasionally, the creasote has been applied. A recent writer, (*Alex. Ure*), has found the chloride of zinc speedily check, and permanently cure, the disease. He applied it in a paste, made with one part of the chloride and two or three parts of the anhydrous sulphate of lime. One or two applications of the paste were generally sufficient to produce a proper eschar, and when this was detached, the sore was treated with water dressing.

II. ELEPHANTIASIS GRÆCORUM.

SYNON. Lepra tuberculosa, L. Ægyptiaca, L. alba, L. Hebræorum, L. leontina, L. Mosaica, Tsarath of Moses, Leontiasis, Satyriasis, Lepra, Leuce, Morphæa alba, Baras, Vitiligo; Fr. Lèpre tuberculeuse, Elefantiasis des Grecs, Ladrerie, Tête de veau, Mal rouge de Cayenne; Ger. Weisse oder Mosaische Aussatz, Knollige Aussatz.

Tuberculous lepra or elephantiasis of the Greeks, is said to be characterized by small tumours, which appear chiefly on the face, but are seen, also, on other parts of the body. They are of irregular shape; vary much in size; are soft to the touch, and of a reddish or livid colour at first; but, subsequently, of the same colour as the rest of the surface. When they occur upon the face, the nose, ears, lips, &c. become involved in the eruption, and as it is accompanied with a thickened and rugous state of the skin, the features become terrifically deformed, (*Schedel, J. Green*;) and the altered integument has been likened to that of the elephant, whence the name of the disease.

The affection is hardly known in Europe, except in persons who have resided in intertropical countries; nor is it usual with them. The common idea was, that it is communicable by contagion; but the evidence is strongly against this—so much so, that few—if any—now entertain it; in which respect it would appear to differ essentially from the elephantiasis or Greek leprosy, which prevailed

so extensively in Europe during the middle ages, and was universally held to be contagious. (*J. Green.*) A predisposition to it would seem, likewise, to be laid in the organization of the child, where the parent has suffered from it.

In climates that are favourable to it, it is affirmed, that heat and moisture aid its development,—as well as imperfect nutrition,—any cause, indeed, that reduces the system beyond the due point, or deranges the organic actions. Accordingly, the habit of drinking spirituous liquors has been classed amongst the occasional causes. (*Andral, Schedel.*)

The disease is exceedingly obstinate, and the prognosis very unfavourable: it has been doubted, indeed, whether anything more than temporary benefit has been derived from any course of treatment. The organs of the voice, and afterwards those of respiration and digestion, ultimately become affected almost invariably; and the patient dies of chronic pneumonia, of phthisis, or of disease of the lining membrane of the alimentary canal. (*J. Green.*)

Treatment.—When the disease is first observed, it has been advised, that the climate should be changed immediately, and every endeavour be made to induce a thorough revulsion in the system of nutrition.

The preparations of sarsaparilla, and especially the old decoction of the woods—*decoctum sarsaparillæ compositum*—have been largely exhibited, but the evidences in their favour are not strong. The greatest number of testimonials has been brought forward in favour of arsenic, which has been given both in the form of the arsenious acid, and of Fowler's solution—the liquor arsenitis potassæ. The different preparations of iodine, recommended under lupus, may be administered, as well as escharotics, which may induce a new action in the vessels of nutrition of the skin.

As in lupus, too, it has been observed, that intercurrent erysipelas has acted beneficially; and, from the hint thus obtained, blisters have been applied to the affected parts. (*Bielt.*)

The actual cautery has also been used in the advanced stages with benefit, by the observer last cited. (*Schedel.*)

The general symptoms must be met, according to the precise indications that may present themselves.

III. FRAMBESIA.

SYNON. Yaws, Pian, Micosis, Thymiosis; *Fr.* Framboise; *Ger.* Pians, Erdbeerpocken, Himbeerpocken, Indianische Pocken.

This cutaneous affection,—so called from its resemblance to a raspberry,—like the one just considered, is indigenous elsewhere, and but rarely seen amongst us. The descriptions of writers in regard to it differ.

It is described by one (*Schedel.*) who had an opportunity of witnessing a case, which fell under the care of M. Bielt, as being characterized by the evolution of small red tuberculous tumours, which are generally distinct from each other at the summit, but

are connected by the base, and are very similar in form, colour and size, to a raspberry or mulberry.

These are of various extent, and on every part of the cutaneous surface; but they are more frequently seen on the scalp, face, axillæ, groins, and around the anus and organs of generation.

In the case described by MM. Cazenave and Schedel, the disease occupied the whole of the front and inferior parts of the thigh, and seemed to consist less of a cluster of tumours, developed within the substance of the derma, than of the derma itself in a state of hypertrophy, and covered by a multitude of vegetations.

One of the tubercles, it is affirmed, generally acquires a larger size than the others, and ultimately ulcerates, forming a foul ulcer. To this the negroes, where the disease is indigenous, usually give the name *Mama Pian*, or *Mama Yaw*.

The disease is said to be usually preceded, followed or accompanied by more or less constitutional disturbance of a febrile character; and continues for a long period without materially affecting the general health.

Framboesia is endemic in Guinea, and amongst the negroes in the West Indies. It may attack persons of all ages; but, like the eruptive diseases of this country, it commonly occurs in childhood; and, like them also, appears to attack a person but once during life. It has been affirmed to be propagated solely by the application of the matter from the surface of wounds in those who have not previously passed through the disease, (*Bateman*;) but this scarcely seems sufficient to account for its extension.

Treatment.—At the commencement of the disease, the treatment should be entirely antiphlogistic; but when the eruption begins to decline, a revulsive management, similar to that recommended internally in lupus, becomes necessary—as the various preparations of iodine, arsenic or mercury—singly or combined. The troublesome ulcerations, that succeed, may require the employment of caustics or even of the actual cautery.

IV. MOLLUSCUM.

SYNON. Ger. Schwammgeschwulst.

Although this affection—so called in consequence of its resemblance to certain molluscous animals, (*Andral*)—has been classed by some dermatologists, (*Willan*, *Bateman*;) amongst the tubercula; it is not admitted there by others, (*Rayer*;) and, owing to the rarity of the morbid condition, accurate notions of it are not yet, perhaps, entertained. (*Blasius*.) It consists of numerous tumours, varying in size from that of a pea to that of a pigeon's egg, filled with an atheromatous matter, which are developed in the substance of the cutis; and are of various shapes—some round or flattened, and having a large base; others adherent by means of a pedicle.

Simple molluscum appears to be wholly local, and to be unmodified by any special condition of the general system. It does

not inflame, and is apt to remain stationary through life, after having attained a certain degree of development

A more singular variety of this affection is that described under the name *Molluscum contagiosum*; of which cases have been given by different observers, (*Bateman, Carswell*; and more recently, *W. Henderson, R. Paterson, Turnbull*.) Although admitted as a variety of molluscum, it differs essentially from the non-contagious form, and has been considered to consist of a morbid enlargement, and derangement of the sebaceous follicles, rather than of a tubercular affection of the proper texture of the cutis vera. (*J. Green*.)

Molluscum contagiosum is described as characterized by the presence of hard, round tubercles, which are smooth and transparent, and, when pressed, pour out from an orifice on their summits a little opaque or milky fluid.

The affection is uncommon. Several of the most experienced dermatologists, (*Bielt, Schedel, Willan, Alibert, Rayer*,) have never met with a case. In the cases that have been related, there has been evidence of its communicability. An infant at the breast, who had the disease on its face, communicated it to the breasts of its mother; and to two other members of the family, in whom it appeared on the hands. The child himself seemed to have caught it from a brother, who contracted it from a boy at school. (*Carswell*.) This variety of the disease is accompanied by tumefaction of the glands; and occasionally by so much constitutional irritation as to gradually destroy the patient.

Treatment.—The causes of molluscum are wholly unknown; and the treatment is unsatisfactory. In the majority of cases, indeed, the disease remains stationary in spite of all remedies. In one case, in which the tubercles occurred in great numbers on the anterior part of the neck of a young woman after delivery, a lotion of the sulphate of copper, applied repeatedly during the day, appeared to be of essential service. (*Bielt*.) In the contagious variety, arsenic—in the form of Fowler's solution—has been advised. (*Bateman*.) The cases seem to be such as to require the internal revellents, recommended under the affections last described.

The external management consists in the employment of measures that are calculated to excite the tubercles to inflammation. This has been effected by touching them with caustic potassa, (*R. Paterson*,) and the earlier this is done in the progress of each the better. It has likewise been suggested, that a fine point of nitrate of silver introduced into the aperture would effect the same object. (*W. Henderson*.) A recent writer, (*R. Paterson*,) is inclined to look upon internal remedies, in general, as too tedious, "when the local ones can be applied with so little pain to the patient, such surety to the destruction of the tumour, and in so much shorter a space of time."

Cancer or the *Cancerous tubercle of the skin*, is so essentially

surgical, as not to require examination here. It is, moreover, only one of the phenomena of the Cancerous Cachexy.

Similar remarks apply to the *Furuncular affections of the skin*, comprising Furunculus and Anthrax. They implicate the cellular membrane also, and are universally classed in the domain of Surgery, although treated of by certain writers on Diseases of the Skin.

SECTION VIII.

MACULÆ.

SYNON. Dischroa, Discoloured states of the Skin; *Fr.* Tache; *Ger.* Flecke.

Discolorations are induced by some modified action of the vessels, that secrete the colouring matter of the skin. In cases of severe disease, the appearance of the whole surface is affected, so that, at times, a state of achroa or want of colour is induced, which is the condition in many chronic maladies. In other affections, a sallow or livid tint prevails, especially where a cancerous *vice* exists; but these are not the conditions, which fall under the head of Maculæ. The term is applied to discolorations which are more or less circumscribed, and which are not necessarily accompanied by any elevation of the surface.

The affections, classed under this head, are Lentigo, Chloasma, and Nævus.

I. LENTIGO.

SYNON. Ephelis lentiformis, Ephelides, Vitiligines, Phaci, Maculæ solares, Pannus lenticularis, Freckle; *Fr.* Taches de Rousseur, Ephélides; *Ger.* Sommerflecken, Sommersprossen.

This eruption, commonly known under the name of "freckle," is familiar to every one. It consists of small rounded brownish-yellow coloured stains, which appear upon the face, neck, hands, &c.—rarely occurring on parts that are covered. They are almost peculiar to fair and florid complexions, and especially to those where hair is red in any of its shades.

They are most abundant in childhood and youth, and appear to be owing to accumulations of the colouring matter of the skin; for the cutis vera appears to be entirely unaffected. These accumulations are evidently owing to exposure to light and heat.

Treatment.—The prophylactic treatment consists in defending the surface as much as possible from too vivid a glare of light. When they have once occurred, they are not easily removed. Milk and water, alcohol and water, liquor potassæ largely diluted, and the nitromuriatic acid diluted, have been used, as well as the Cologne water and Florida water, and various other cosmetics, but they generally fail.

II. CHLOASMA.

SYNON. Maculæ hepaticæ, Pannus hepaticus, Liverspots; *Fr.* Taches hépatiques; *Ger.* Leberflecke.

This affection is essentially like the one just described; indeed, the term *ephelis* has been applied to it also. It is characterized by one or more broad irregular-shaped patches, usually of a lighter or darker shade of yellow, or yellowish-brown, and occurring most commonly on the front of the neck, breast, abdomen, groins, and inner surface of the thighs. The patches are at first distinct; but they frequently spread until they coalesce, and form a large discoloured blotch. The patches do not generally rise above the surface. They are accompanied with more or less itching; and, sooner or later, there is, at times, slight cuticular desquamation.

Occasionally, the blotches are very evanescent, not lasting longer than a few hours; but, at other times, they continue for a few days. The evanescent form is commonly seen in females about the menstrual period, and during pregnancy. (*Cazenave* and *Schedel*.) At other times, the affection lasts for weeks and months, without there being any sign whatever of constitutional disturbance.

The causes of this altered condition of the chromatogenous apparatus of the skin are not easily appreciable. From what has been said, it is obviously connected with certain states of the system—as menstruation and pregnancy; yet it often occurs without our being able to assign any sufficient cause for it.

Treatment.—Chloasma generally disappears very readily by the use of sulphur, either administered internally, (sulphur. sublimat. gr. xv. morning and evening, in milk,) or externally. A good lotion for this purpose is the following:—

R.—Potass. sulphuret. ʒj.
Aquæ, Oij.—M.

The occasional application of this will often relieve the very troublesome itching. (*Schedel*.)

Should the affection be very obstinate, it may be removed by a visit to the sulphur waters of Virginia or elsewhere. The joint internal and external use of the waters, aided by the thorough change of the physical and moral influences surrounding the individual, will rarely fail in accomplishing a cure.

III. NÆVI.

SYNON. Nævus maternus, Macula materna, Metrocelis, Mother's mark; *Fr.* Envie; *Ger.* Muttermal.

This affection appears under two forms—one in which there is a permanent discoloration from some morbid and unaccountable modification of the rete mucosum; and the other in which the vessels of the skin are originally morbid.

The former have received the names *nævi pigmentares*, *spili* or *moles*. They are observed on various parts of the body, and are, at times, of great extent. The dark discoloration of the face, occasionally seen, belongs to this variety. They are of no consequence;

are original malformations, and remain during life; so that they can scarcely be regarded as a form of cutaneous disease.

The other, called *nævi vasculares*, which are equally dependent upon malformation, may become of consequence, owing to their being formed of an erectile vascular tissue; and it is occasionally necessary to remove them. They then fall under the hands of the surgeon.

SECTION IX.

SYPHILIDES.

SYNON. Syphilida, Syphilitic eruptions; *Fr.* Dermo-syphilidies, Dermatosies véroleuses.

Eruptions assuming the elementary character of the various classes already considered, with the exception of the maculæ, are produced by the contamination of syphilis. Their main characteristics have been depicted as follows:—Exanthemata, bullæ, vesiculæ, papulæ, squamæ or tubercula, whose base almost always has a red copper tint. (*Rayer.*)

The diagnosis of these eruptions is, however, by no means easy. It has been affirmed, indeed, that they require a practised eye and long experience, as well as an attention to all the data furnished by the history of the case,—as the preëxistence of the local primary evidences of syphilis, as well as the coëxistence of other venereal symptoms. (*Andral.*)

These affections have been considered at length by certain writers on the diseases of the skin, (*Alibert, Rayet, Schedel, J. Green;*) but as they form part of the phenomena of syphilis, they properly fall also under that head, and are accordingly treated of at length in the different monographs on syphilis.

BOOK VI.

DISEASES OF THE NERVOUS SYSTEM.

IN man and the upper classes of animals, the nervous system is of great pathological as well as physiological interest. It has been esteemed as not only the essential instrument of vital association, but of vital endowment, and, therefore, present in every body possessed of life—in the vegetable as well as the animal. By many distinguished anatomists, it has been conceived to be the first formed in the fœtus, and it has been maintained, that the presence or absence of any of its portions regulates the presence or absence of the organ to which they are ordinarily distributed. If, however, we admit that a distinct system of nerves exists in the vegetable, a wide distinction between them and those that are present in the upper classes of animals is at once apparent;—there being, in the former, no great centre to which those impressions can be referred. The pith of the vegetable, with the various knots or ganglia in its course, has, indeed, been regarded (*Brachet*) as a nervous system resembling the ganglionic or sympathetic system in man, under whose presidency the mass of physiologists consider, that the organic actions of nutrition and secretion are accomplished.

The same views are applicable to the lowest divisions in the animal scale, in which, although we may meet with ganglia and nerves, we have nothing like brain or spinal marrow. It has been conceived, therefore, that up to a certain elevation in the scale of life, all the functions of the body are carried on under the presidency of the ganglionic system. But, although it may be true, that such a system exists in those animals, there is reason for believing, that it is not identical with the ganglionic or sympathetic system which is found in the upper classes. Since the promulgation of the views of a recent observer (*Marshall Hall*) on the nervous system, new researches have been undertaken, and it would seem, that the ganglionic system, met with in all animals, is rather concerned with certain functions, which Dr. Hall has ascribed too exclusively to the spinal marrow, inasmuch as they are met with in the invertebrata as well as the vertebrata.

In man, all the nerves of the human body, according to the

writer just cited, may be divided into three classes: *First*, The cerebral, or the sentient and voluntary. *Secondly*, The true spinal, or excito-motory; and *Thirdly*, The ganglionic, or the nutrient and secretory. If the sentient and voluntary functions be destroyed by stunning an animal by a blow on the head, the sphincter muscles will still contract when irritated, because the irritation is conveyed to the spine by an appropriate nerve, and the reflex action takes place to the muscle so as to throw it into contraction; but if the spinal marrow be now destroyed, the sphincters remain entirely motionless, because the centre of the system is destroyed. Dr. Hall thinks, that a peculiar set of nerves constitute, with the true spinal marrow as their axis, the second subdivision of the nervous system; and he distinguishes them into the *excitor* and *motory*. The *first* or the *excitor* nerves pursue their course principally from external surfaces, characterized by peculiar excitabilities, to the true medulla oblongata and medulla spinalis; the *second* or the *motor* nerves pursue a reflex course from the medulla to the muscles, having peculiar actions concerned principally in ingestion and egestion.

Dr. Hall thinks farther, that there is good reason for viewing the fifth encephalic and posterior spinal nerves as constituting an external ganglionic system for the nutrition of the external organs; and he proposes to divide the *ganglionic* subdivision of the nervous system into *first*, the *internal ganglionic*, which includes that usually denominated the sympathetic, and probably filaments of the pneumogastric; and *secondly*, the *external ganglionic*, embracing the fifth and posterior spinal nerves.

The important views of Dr. Hall met with much opposition, not only on the ground of want of originality, but also of adequate foundation, but they experienced the able support of Müller, Grainger and others, and seemed to the author, "calculated to explain many of the anomalous circumstances which we so frequently witness." (See the author's *Human Physiology*, 4th edit. i. 75: Philad. 1841.) The inadequacy of the evidence adduced by Dr. Hall was strongly urged, in different able papers in the *British and Foreign Medical Review*, by Dr. Carpenter, of Bristol, who has since, however, on a full investigation of the matter, in the various classes of animals, arrived at results strikingly confirmative of the existence of an excito-motory system, which is largely concerned in the execution of various most important functions.

The general conclusions, which he has deduced, are, *First*, That a nervous system, in the form of connected filaments with ganglia on certain parts of them, exists in all animals,—that is, in all beings endowed with any degree of sensibility and voluntary power, although its presence may not be detected by our means of observation. *Secondly*, That the actions, most universally performed by a nervous system, are those connected with the introduction of food into the digestive cavity. *Thirdly*, That we have reason to regard this class of actions to be everywhere independent of voli-

tion, and perhaps also of sensation,—the propulsion of food along the œsophagus in man being of this character. *Fourthly*, That for the performance of any action of this nature, a nervous circle is requisite, consisting of an *afferent* nerve, on the peripheral extremities of which an impression is made; a *ganglionic centre*, where the white fibres of which that nerve consists terminate in gray matter, and those of the efferent nerve originate in like manner; and an *efferent* trunk conducting to the contractile structure the motor impulse, which originates in some change in the relation between the gray and the white matter. *Fifthly*, That such actions may be regarded as the simplest of those which the nervous system performs, and most resemble the examples of contraction produced by the irritation of distant organs in plants, of any which the animal kingdom affords. *Sixthly*, That in the lowest animals such actions constitute nearly the entire function of the nervous system; the amount of those involving sensation and volition being very small. *Seventhly*, That as we ascend the scale, the evidence of the participation of true sensation in the actions necessary for acquiring food, as shown by the development of special sensory organs, is much greater; but that the movements *immediately* concerned with the introduction of food into the stomach, remain under the control of a separate system of nerves and ganglia, to the action of which the influence of the cephalic ganglia,—the *special*, if not the *only*, seat of sensibility and volition,—is not essential. *Eighthly*, That in like manner, the active movements of respiration are controlled by a separate system of nerves and ganglia, and are not dependent upon that of sensation and volition, though capable of being influenced by it. *Ninthly*, That the centres of these systems are brought into closer structural relation with that of the “*sensori-volitional*” system as we ascend the scale of invertebrated animals; until they at last apparently become a part of it, as in vertebrata, where, however, they still remain really separate, and may be artificially insulated. *Tenthly*, That whilst the actions of these systems are, in the lower tribes, almost entirely of a simply reflex character, we find them, as we ascend, gradually become subordinated to the will; and this is effected by the admixture of fibres proceeding directly from the cephalic ganglia with those arising from their own centres. *Eleventhly*, That the locomotive organs, in like manner, have their own centres of reflex action, which are independent of the influence of volition, perhaps also of sensation. *Twelfthly*, That the influence of the will is conveyed to them by separate nervous fibres, proceeding from the cephalic ganglia; and that similar fibres probably convey to the cephalic ganglia the impressions destined to produce sensations. *Thirteenthly*, That the stomato-gastric, respiratory and locomotive centres are all united in the spinal cord of the vertebrata, where they form one continuous ganglionic mass; and that the nerves connected with all these also receive fibres derived immediately from the cephalic ganglia. *Fourteenthly*, That whenever peculiar con-

sentaneousness of action is required between different organs, their ganglionic centres are united more or less closely, and that the trunks themselves are generally connected by bands of communication. *Fifteenthly*, That the sympathetic system does not exist in the lowest classes in a distinct form;—that the nervous system of the invertebrata, taken as a whole, bears no analogy with it; and that as the divisions of this become more specialized, some appearance of a separate sympathetic presents itself, but this is never so distinct as in vertebrata. *Sixteenthly*, Hence it may be inferred, that as the sympathetic system is not developed in proportion to the predominant activity of the functions of organic life, but in proportion to the development of the higher divisions of the nervous system, its office is not to preside over the former, but to bring them into relation with the latter; so that the action of the organs of vegetative life are not dependent upon it, but influenced by it in accordance with the operations of the system of animal life. (*W. B. Carpenter.*)

The result of all these inquiries would, consequently, lead to the belief, that the functions of nutrition and secretion, which must exist in the humblest of organized creations, are carried on under nerves which belong to the reflex class, instead of the sympathetic to which we have been in the habit of referring them. Recent experiments exhibit, indeed, that the great sympathetic is a less important part of the organism than is usually supposed, (*Sir Astley Cooper*,) and almost justify the question propounded by Magendie in the first edition of his *Physiology*, whether it be really a nerve? When Sir Astley tied the great sympathetic on a dog, he found that but little effect was induced; the animal's heart appeared to beat more quickly and feebly than usual; but of this circumstance he could not be positive on account of the natural quickness of its action. The animal was kept seven days, at which time one nerve was ulcerated through, and the other nearly so, at the situation of the ligatures. Another animal was still living at the time he wrote, on which the sympathetic had been tied nearly a month.

To the views of Dr. Hall we shall have frequent occasion to refer in explaining many of the important diseases of the nervous system. To the cerebral system of nerves, in his division, he assigns all diseases of sensation, perception, judgment and volition,—therefore all painful, mental and comatose, and some paralytic diseases. To the true *spinal* or *excito-motory* system he refers all spasmodic and certain paralytic diseases, but he properly adds, that these two parts of the nervous system influence each other both in health and disease, as they both influence the ganglionic system.

In investigating the diseases of the nervous system, it is important to bear in mind, that it is inclosed in various membranes or *meninges*, which may be themselves affected with disease singly, or along with the substance of the encephalon and spinal marrow. These membranes are the dura mater, the arachnoid, and the pia mater,—the arachnoid being a serous membrane, which secretes a

thin fluid for the purpose of lubricating the encephalon, and enters into all its cavities.

The medulla spinalis, according to some anatomists, is composed of three tracts or columns, on each side—an anterior, a middle, and a posterior; and it is the opinion of a distinguished physiologist, (*Sir Charles Bell*), that whilst the anterior column gives origin to nerves of motion, and the posterior to nerves of sensation, the middle column gives origin to a third order, having the function of presiding over the respiratory movements, and which are called by *Sir Charles Bell*, the *respiratory nerves*.

This view would lead to the admission of at least three sets of nerves,—one destined for motion, one for sensation, and a third for a special kind of motion—the respiratory; and that every nerve of motion communicates to the muscles, to which it is distributed, the power of aiding, or taking part in, motions of one kind or another,—so that a muscle may be paralyzed, as regards certain movements, by the section of a nerve, and yet be capable of others of a different kind, by means of the nerves that are uninjured.

This division is not, however, universally received; and even by some, who are of opinion, that the sensitive and motor filaments arise from distinct tracts of the spinal cord, it is denied, that this is the case with those that arise from the upper part of the cord,—there being a blending of the sensitive and motor tracts there, which cannot easily be explained. (*J. Reid, J. Müller.*)

Pathological cases, too, occasionally occur, which throw great difficulty on this subject. Two have been related recently, (*Stanley, Budd*), in which disease was confined to the posterior column, yet sensation remained unimpaired; whilst the power of motion in the lower extremities was lost. Many physiologists, too, are of opinion, that there is no special column destined for respiration, and that there appears to be nothing so peculiar in the action of the respiratory muscles, that they should require a distinct set of nerves.

As elsewhere remarked, (*Human Physiology*, 4th edit. i. 68: Philad. 1841,) much evidently remains to be accomplished, before the precise arrangement of the columns of the spinal cord, and of the relations of the nerves connected with them, can be deemed established. *Sir Charles Bell*, indeed, has of late renounced his former opinion, that the posterior roots of the spinal nerves proceed from the posterior column, and he now describes them as arising from the middle column,—affirming, at the same time, that it is not impossible, that the posterior column may be connected with the sensitive roots of the spinal nerves, although he has not hitherto succeeded in tracing it.

The *neurine* or nervous substance, of which the nervous system is composed, is soft and pulpy, but it is proper to bear in mind, that its consistence varies in different portions, and, in the whole, at various ages. In the fœtus it is semifluid; in youth, of greater firmness, and of still greater in the adult. The consistence varies, again,

according to the period that has elapsed since the death of the individual. It loses its firmness by being kept, and ultimately becomes semifluid. It is likewise—as will be seen—rendered semifluid by disease, constituting softening of the brain, which has, of late years, been described as a special morbid condition of the viscus.

The neurine is composed of two substances, which exhibit a very different appearance on dissection: the one of these is gray and of soft consistence—the *cortical* or *cineritious* substance; the other is white and more compact—the *white* or *medullary* substance. Although, however, the gray substance is termed *cortical*, it is not always seated at the exterior. In the medulla spinalis, the situation of the two substances is reversed. The general belief amongst physiologists is, that the nervous power originates in the gray matter, and is conveyed along the medullary to all parts that are supplied by nerves. It is believed, moreover, that the mental manifestations are more particularly—if not wholly—elicited by the action of the gray substance at the circumference of the brain; but this is a topic of profound physiological investigation, and by no means settled. It cannot be entered into here.

A few words may be necessary in regard to the circulation in the encephalon. The passage of the chief blood-vessels—the carotids and the vertebrals—is extremely tortuous, so that the blood cannot impinge on the brain with any great force, and the vessels become capillary before they enter the organ—an arrangement, the importance of which is obvious, when it is recollected how large an amount of blood is sent to the encephalon. This amount must, of course, vary according to circumstances. In hypertrophy of the heart, the quantity is, at times, greatly increased, as well as in active hyperæmiæ or in determinations of blood—as they are termed—to the encephalon. It is obvious, too, that an equal accumulation may occur, if the return of the blood from the head, by means of the veins, be in any manner impeded, as when we stoop, or compress the veins of the neck by a tight cravat, or by keeping the head turned for any length of time.

It has been maintained by many, that the circulation of the brain is such, that the neurine cannot be compressed by any force which can be conveyed to it from the heart through the arteries, whilst the vessels are in a state of integrity; and that, in like manner, the amount of blood cannot be diminished, without something entering to supply the place, which had become vacant; and hence, that the quantity of blood, circulating in the brain, in health, is always identical, and distributed in certain proportions between the arterial and venous vessels. (*Abercrombie.*)

Yet it appears clear, that the quantity distributed to the different vessels must vary according to circumstances, and that this variation must give occasion to different effects on the nervous system. A recent writer has gone so far as to affirm, that “as far as the explanation of morbid phenomena is concerned, the terms “change of circulation within the cranium,” and “pressure on the brain,”

are synonymous, as the one cannot take place without the other." (*J. H. Bennet.*) This view, however, is scarcely tenable, for direct experiment shows, that if the flow of blood to the brain by means of the great vessels be prevented, phenomena are induced, which certainly cannot be referred to accumulation of blood in the encephalon, or to pressure.

Of the main arteries, that supply the encephalon, it would appear, that the vertebral are much more important vessels, as regards the brain and its functions in certain animals—as the rabbit—than the carotid. By tying them, the nervous power was much lessened, and the animal did not, in any case, survive the operation more than a fortnight. (*Sir Astley Cooper.*) In dogs, also, Sir Astley tied the carotids with little effect, but the ligature of the vertebrals had a great influence. The effect of the operation was to render the breathing immediately difficult and laborious, owing, in his opinion, to the supply of blood to the phrenic nerves, and the whole "respiratory tract" being cut off. The animal became dull and indisposed to make use of exertion, or to take food. Compression of the carotids and the vertebrals at the same moment in the rabbit destroyed the nervous functions immediately. This was effected by the application of the thumb to both sides of the neck, the trachea remaining quite free from pressure. Respiration entirely ceased, with the exception of a few convulsive gasps.

It has been already remarked, that the cortical part of the brain has been considered to be concerned in the intellectual and moral manifestations. It is in the encephalon that sensation is experienced and volition sets out; for although nerves of sensation and of motion may be distributed over every part of the organism, their great centre would appear to be seated below the level of the centrum ovale of Vieussens, and not lower perhaps than the tubercula quadrigemina. Of the mode in which the fibres of the medulla spinalis proceed upwards, so as to form, by their expansion, the encephalon, opportunity will occur hereafter to speak, as well as to explain certain phenomena, that are connected with the decussation of those fibres in the medulla oblongata; topics which are fully explained, however, in another work by the author, (*Human Physiology*, 4th edit. vol. i. pp. 81 and 339: Philada. 1841.)

CHAPTER I.

ORGANIC DISEASES OF THE NERVOUS CENTRES.

I. HYPERÆMIA OF THE NERVOUS CENTRES.

SYNON. *Fr.* Hypérémie ou Congestion des Centres Nerveux.

THIS affection consists in an accumulation of blood in the vessels of some portion of the nervous centres; at times, affecting the whole of the cerebrum, cerebellum, or medulla spinalis; at others, affecting only detached portions of those organs, and this depending upon the particular vessels on which the cause of the hyperæmia may exert its action.

It may be convenient to consider separately the phenomena of hyperæmia, according as it affects the three great divisions of the cerebro-spinal axis—the cerebrum, cerebellum, and medulla spinalis.

a. *Hyperæmia of the Cerebrum.*

SYNON. *Fr.* Hypérémie du Cerveau, Encéphalohémie. (*Piorry.*)

Diagnosis.—The symptoms of cerebral congestion differ according to the degree of the hyperæmia, and to the particular part of the brain where it exists. When slight, it is indicated by cephalalgia, vertigo, confusion and somnolency—the patient at the same time preserving his intellectual faculties, sensibility, and power of motion; at other times, there is a slowness and sluggishness of the movements; and, occasionally, the opposite condition of increased activity and incessant desire to be moving; and formication sometimes exists on one or both sides in the limbs or face. The pulse is full, tense and vibratory; the temporal and carotid arteries beat with violence, even although the pulsations of the heart may be natural. The face is red; the eyes are injected, and epistaxis may supervene. These symptoms may or may not be attended with fever, and they may continue for a short or longer period, recurring, at times, periodically,—every evening for example; or at distant intervals, as at spring and fall.

When the hyperæmia is to a greater degree, there is sudden and total loss of consciousness, the patient falling down as if deprived of life: this is one of the forms of *apoplexy* of most writers, and, by the French, termed *Coup de Sang*.

In this condition, he may remain for a longer or shorter period, deprived of all or almost all sensation, volition, and mental and moral manifestation: death may take place in a few minutes, or there may be a rapid or gradual restoration to health; the intellect remaining, for a time perhaps, disordered; the senses impaired, the

speech embarrassed; with more or less general or partial debility; but no hemiplegia or other form of enduring paralysis, as is the case when the above symptoms are induced by cerebral hemorrhage. Such, at least, is the general rule; but there are exceptions to it. At times, hemiplegia or paralysis of one side of the body supervenes on cerebral hyperæmia; but, different from what occurs in hemiplegia from cerebral hemorrhage, it may pass off as suddenly as it occurred. (*Ducasse.*) Cases, however, are on record, in which there has been persistent paralysis, without any evidences of cerebral hemorrhage on dissection. (*Lelut.*) This severe form is not uncommonly accompanied with convulsions; at other times, the tongue is suddenly paralyzed, but sooner or later recovers.

In some cases, apparently produced by hyperæmia of the brain, the functions of sensibility and mobility have been mainly affected. The case of a person is related, who, for the space of a month, was attacked several times in the course of the day with general paralysis. His attacks continued for about five or six minutes, and they were ultimately cured by copious blood-letting. (*Andral.*)

Lastly, the principal indication of hyperæmia may be the intellectual disturbance, which may exist alone, or be associated with some slight disorder of sensation or motion. In this case, the delirium is, at times, intense; the patient may exhibit enormous muscular power; and death may follow in consequence of deficient nervous supply to the respiratory apparatus, so that the patient dies as it were asphyxied—the face being florid and swollen, and, at times, livid and black.

Why these various symptoms should arise from the same pathological state can only be explained by the presumption, that particular parts of the encephalon have been implicated in one case and not in another; but our knowledge of the precise functions, executed by different portions of the brain, does not enable us to point out those that are especially concerned in any of these cases. Some have supposed, that congestion, confined to the cortical substance of the hemispheres, gives rise only to disorder of the intellect; but others have seen cases in which the function of motility was affected, where the cortical substance was alone implicated; whilst, again, the intellect has been disordered in cases where the cortical substance was found unaffected.

We shall only be able to account for the different symptoms induced by hyperæmia of different parts of the brain, when farther and repeated inquiry shall have better instructed us on the physiological functions executed by the various portions of the encephalon.

Causes.—The causes of cerebral congestion may be,—a sudden change from a cold or temperate atmosphere to one, the temperature of which is very elevated; or, more frequently perhaps, exposure to a very cold atmosphere, as during the disastrous campaign in Russia in 1812, when many persons perished in this

manner. Of 114 cases collected by one observer, (*Andral*), 50 occurred in the months of December, January and February; 31 in March, April and May; 36 in June, July and August, and 17 in September, October and November.

Anything that gives occasion to repletion, and on the contrary to exhaustion or debility, may occasion irregularity of action in the vessels of the brain, and, indeed, in the whole of the circulatory system, and produce hyperæmia of that viscus. The effect of extreme exhaustion in inducing this state is well seen in the prostration caused by excessive uterine hemorrhage. The patient may be pulseless, pale, and exanguious, and, in the course of a few hours, may labour under the most manifest symptoms of active cerebral hyperæmia; in which we are compelled to invoke irregularity of vascular action, certainly not polyæmia or vascular fullness; and similar remarks apply to the hyperæmia that accompanies the reaction after cholera.

Many substances, taken into the stomach, and affecting that organ, and, through it, the brain, may produce this pathological condition. Alcohol, opium, and the various narcotics are well known to have this effect, and cases are on record in which overdistension of the stomach by substances, not possessed themselves of any direct action on the brain or nervous system, have occasioned all the effects induced by narcotic poisons. In these cases, the deleterious influence has probably been exerted primarily on the branches of the pneumogastric nerves, distributed to the lining membrane of the stomach; whence it has extended to the brain, so as to produce full and fatal narcosis.

Violent emotions; different chronic affections of the brain; attacks of epilepsy; diseases of the digestive apparatus; hypertrophy, or too great activity of the heart, or any impediment to the return of the blood to that viscus; derangement of the respiratory function; violent muscular efforts,—as straining, vomiting, and sneezing; or simple change of posture, as by turning the head to look backwards; the recumbent posture; the irregularity in the circulatory movements preceding the menstrual period, in the female; excessive venery, or even the simple act of coition—may all be regarded as calculated to induce cerebral hyperæmia.

The disease is most common after the age of 35; but it is seen at a much earlier period; and it would seem to occur more frequently in the male than in the female sex.

b. *Hyperæmia of the Cerebellum.*

SYNON. *Fr.* Hypérémie du Cervelet.

Signs of congestion of blood in the vessels of the cerebellum are so constantly met with, owing to position, that it is difficult—often impracticable—to distinguish the normal from the morbid condition.

The functions assigned to the cerebellum have been so numerous

and diversified, that we are compelled to remain in doubt as to the phenomena over which it presides in health. By some, regarded as the seat of sensibility, (*Foville*;) by others, as the seat of the forward impulse, (*Magendie*;) and by others, again, (*Gall*, *Spurzheim*,) as the encephalic organ of generation or amateness, we might expect, that congestion of the vessels of the cerebellum would give rise to aberrations of those functions, which might at once enable us to detect the disease; and, at the same time, to confirm or disprove the views of those physiologists. We are compelled, however, to remain in doubt, and to wait for fresh researches. Andral, indeed, thinks, that he has observed some facts confirmative of the opinion, which places in the cerebellum the faculty of reacting on the generative organs; whilst Magendie refers to pathological cases, in illustration of his view, that the forward impulsion is seated in the cerebellum; the backward in the corpora striata. In these cases, the cerebellum being diseased, the balance, he conceives, has been destroyed, and an irresistible tendency to recoil been experienced. All this requires new and repeated investigations. (See the author's *Human Physiology*, 4th edit. i. 345: Philad. 1841.)

c. Hyperæmia of the Spinal Marrow.

SYNON. *Fr.* Hypérémie de la Moelle épinière, Hypermyélohémie. (*Piorry*.)

This cannot be a common occurrence, nor is it readily diagnosed. It may, of course, be seated in various portions of the spinal marrow, and, according to the precise part affected, the organs to which the nerves proceeding from it are distributed must be implicated; thus, if it exist in the upper portion, the thoracic extremities may be affected; if in the lower, the abdominal, &c.

Diagnosis.—The sensibility or motility of different parts of the frame, as of the upper or lower extremities, may be augmented or diminished, whilst the intellectual faculties and the senses may be untouched. At times, along with paralysis of the muscles of the extremities, either general or partial convulsions may be present, indicating that the encephalon is at the same time implicated. As the respiratory function and the action of the bladder are influenced by the spinal nerves, they may be modified: the circulation may remain natural, or it may be accelerated or retarded.

As to the terminations of hyperæmia of the spinal marrow;—after a longer or shorter duration, it may terminate spontaneously, or in hemorrhage, or in the effusion of serum, or it may induce death.

Causes.—These are obscure. Like hyperæmia of the encephalon, it is most common after the age of 35; although examples are occasionally met with at a much earlier period.

Pathological characters.—In the case of the nervous centres, as elsewhere remarked, it is by no means easy to detect with certainty the hyperæmic appearances on examination after death. The point of departure must be an accurate knowledge of the condition of

the vessels of the great nervous centres, when hyperæmia has been unsuspected, and the patient has evidently died of some other affection. Signs of engorgement of vessels frequently present themselves, which are referable to the depending position of the head, and this is a cause, why the cerebellum is always found more injected than the cerebrum: much may, likewise, depend upon the amount of impediment to free circulation and respiration, which had existed prior to the patient's dissolution.

A writer of eminence (*Andral*) has pointed out the appearances presented by different parts of the nervous centres in the normal state. The gray substance is found to contain more vessels than the white, and is, consequently, more manifestly injected; and the bases of the anfractuosities are more injected than the summits of the convolutions.

The cerebellum, as before remarked, is normally more injected than the cerebrum, and the largest vessels are around the corpus rhomboidale. This grayish portion of the spinal marrow is naturally of a slightly red appearance, and the younger the subject the more it is usually injected.

In hyperæmia of the nervous centres, a red appearance is observable in the congested portions. The redness is dotted, or irregular in the white substance, and uniform in the gray; and it may vary from a bright colour to a darker. If the congestion has occurred for some time, the colour may be yellow or slate, an appearance, which has been attributed in one case to the diminution of the colouring matter of the blood, in the other to the deposition of fresh colouring matter. (*Andral*.) The sub-arachnoid tissue is commonly somewhat infiltrated,—a natural consequence of the congested condition of vessels,—the watery portions of the blood, as in many other cases of hyperæmia, transuding through the coats of the overloaded vessels; at times, indeed, transudations of blood are found at the surface of the brain.

Treatment of hyperæmia of the nervous centres.—All the symptoms, in the generality of cases, appear to indicate the employment of general blood-letting, after which, the headache, vertigo, confusion, and the other symptoms of encephalic disorder will often cease immediately. Yet discrimination must be employed, as the same train of symptoms may supervene where anæmia and nervous exhaustion are the pathological conditions, and where blood-letting would, of course, be a practice of doubtful propriety. It has been remarked—of course as a rule liable to exceptions—that a different measure of blood-letting is proper in mere congestion, from that which is advisable in actual rupture; that in the former, there is extreme tolerance of loss of blood, whilst in the latter, the system is extremely, and even dangerously, susceptible of this loss. (*M. Hall*.) Where, however, doubts exist as to the propriety of general blood-letting, cupping or the application of leeches may be substituted, which act not only

by the quantity of blood they withdraw from the system, but likewise from the revulsion they induce. The French practitioners advise, for this last purpose, that leeches should be applied over the mastoid processes, to the neck, along the vertebral column, or to the anus; but, as a general rule, the nape of the neck is as good a situation as any, and is that which is usually chosen by British and American practitioners. These are extremely valuable agents.

In addition to the revulsive bleedings above mentioned, brisk cathartics¹ may be exhibited daily or every other day, or stimulating turpentine injections be thrown into the rectum.

¹ R.—Pulver. jalap. gr. xv.
Hydrarg. chlorid. mit.
Pulv. zingib. āā gr. v.—M.—or

R.—Olei tigllii, gtt. ij.
Sapon.

Gum. acaciæ, āā gr. j.—M. fiant pilulæ ij.

One or two, for a dose.

Sinapisms, or sinapised pediluvia, may also be applied to the feet whilst the head is kept cool, if necessary, by spirituous lotions or by cold water; and if the signs of congestion remain for any length of time, or recur with much frequency, a blister may be applied to the nape of the neck, and an intermittent counter-irritation be kept up by applying a fresh one as soon as the former has healed. A seton is sometimes put in the nape of the neck in these cases, but the system speedily becomes habituated to the constant irritation, and it soon ceases to be as efficacious as the intermittent irritation kept up in the manner described.

Revellents—the external especially—are equally indicated in the hyperæmia that is dependent upon anæmia; but care must be taken in the administration of internal excitants, and their effects must be diligently watched.

Where individuals are liable to attacks of hyperæmia of the nervous centres, they should be careful to avoid all excitement, and especially to abstain from alcoholic drinks. Regular exercise should be enjoined; and moderate diet, with not too large a proportion of fluid, to avoid repletion of the vessels.

Too long indulgence in the horizontal position, and too much sleep, must be avoided; and, during the attacks of hyperæmia, the patient should be kept with his head elevated, to facilitate the return of blood from the head by the veins, and impede its access by the arteries.

As far as is practicable, the extremes of heat and cold should be avoided.

II. INFLAMMATION OF THE NERVOUS CENTRES.

SYNON. *Fr.* Inflammation ou Phlegmasie des Centres Nerveux.

The researches of physiologists into the functions executed by particular portions of the encephalon not having led to any very

clear notions on the subject, it is not probable, that their pathology should be indicated by symptoms, which would enable us to detect the particular portion of any one of the nervous centres that may be labouring under disease. We may without difficulty diagnosticate the difference between inflammation, for example, of the encephalon,—that is of the parts within the cranium, and of the medulla spinalis; but we may have difficulty in pronouncing between cases of inflammation of the cerebrum and of the cerebellum or medulla oblongata; and when we have decided, that the disease is encephalitis, or myelitis, we may still be unable to determine whether it affects exclusively, or simultaneously, the membranes, or the medullary substance.

a. *Inflammation of the Cerebrum and Cerebellum.*

SYNON. Empresma cephalitis, Phrenitis, Cephalitis, Inflammatio phrenitis, Cauma phrenitis, Inflammatio Cerebri et Cerebelli et Meningum, Sphacelismus cerebri (of the ancients), Phrensy, Brain fever; *Fr.* Inflammation du Cerveau et du Cervelet, Phrénésie; *Ger.* Entzündung des Gehirns und seiner Häute.

Inflammation may attack any of the organs within the cranium. When it affects the cerebrum, it has been called *Cerebritis*, *Fr. Cérébrite*; the cerebellum, *Cerebellitis*, *Fr. Cérébellite*; and the meninges covering these, *Meningitis*, *Fr. Méningite*. A recent writer, indeed, (*M. Hall*,) applies the last term to inflammation of the membranes at the summit and base, and in the ventricles of the brain; whilst *myelitis* is employed by him to designate inflammation of the substance of the brain and cerebellum. Andral employs the term *Encephalitis* to signify inflammation of the neurine of the cerebrum and cerebellum, and in this signification it will be used here.

The more recent French writers have endeavoured to diagnosticate between the signs of inflammation affecting particular portions of the brain; but their labours have not ended in any very satisfactory results. As the intellectual faculties have been supposed by many to be seated at the periphery of the brain; when much delirium exists, with the other signs of inflammation to be mentioned presently, the phlegmasia has been presumed to be meningitic, or to implicate only the peripheral portions of the brain: when, on the other hand, somnolency and convulsions, or want of power over the apparatus of voluntary motion have predominated, the disease has been assigned to the deeper seated portions of the brain, and especially to the corpora striata, and the thalami nervorum opticorum, in the neighbourhood of which are the cerebral seats of sensation and volition. The fact, however, that membranes exist in the ventricles as well as at the base of the brain, would render any attempt at differential diagnosis in those cases necessarily difficult.

For convenience of description it may be well to separate the consideration of encephalitis or inflammation of the substance of the cerebrum and cerebellum from that of the membranes or meningitis.

1. *Encephalitis.*

SYNON. *Fr.* Encéphalite, Inflammation de l'Encéphale.

Like other inflammations, encephalitis may be acute or chronic.

Diagnosis.—1. *Acute form.*—The encephalon being the organ of sensation, volition, and of the mental and moral manifestations, all these must be necessarily modified during an attack of inflammation; but the degree, to which they are so, is dependent upon the severity, extent, as well as on the character and seat of the inflammation.

When encephalitis is evidenced mainly by violent delirium, it constitutes the phrenitis of the older writers. At times, this is the only encephalic disorder; but, at others, sensation and motion are both implicated. This is augmented by every impression made on the senses; by the slightest light or noise in the chamber, the admission of which will bring on a paroxysm of delirium. This, at times, continues throughout the whole progress of the disease, but where it is about to terminate fatally, coma frequently takes its place. As a concomitant of the delirium there is usually sleeplessness, or disturbed sleep, with great restlessness. At other times, the patient is morose and unwilling to be disturbed; whilst, at others, again, the intellect may remain unaffected, in which case it is presumed, that the inflammation is deep-seated. The reasons for this inference have been given before.

Of the disorders of sensation, violent excruciating headache is the earliest symptom, increased by light or noise; and, at times, the skin is unusually sensible. Along with these symptoms, the sight and hearing are depraved, and flashes of light, with unusual and singular noises, tinnitus aurium, detonations, &c. are heard: whenever, indeed, these symptoms present themselves in the course of an acute attack, the advent of encephalitis is to be anticipated, and measures should be taken to prevent it. (*Andral.*)

Although, in the early period of the disease, the functions of the senses are in an excitable and excited state,—the presence of light and noise being painful, and the pupil contracted,—in the latter periods they become obtunded, and are ultimately, when the case is about to terminate unfavourably, lost.

The presence of encephalitis is not unfrequently indicated by great disorder in the motions,—the patient being much agitated, with tremors, subsultus tendinum, convulsions, and paralysis, which are, indeed, regarded as more certain indications of encephalitis than disorders of the intellect. These convulsions may be general or partial, or certain muscles of the body may be rigidly contracted. (*Andral.*)

The nutritive functions are likewise greatly deranged. Vomiting is almost always, if not always, present, and it may mark the onset of the disease. In its progress, the bowels,—as in other affections, in which there is concentration of action towards the encephalon,—are constipated. The circulation, as in other inflammatory affec-

tions of internal organs, is quickened at the commencement, and the pulse is usually tense; but this is not always the case; and, should the encephalitis terminate by effusion of serous fluid into the ventricles of the brain, it may become unusually slow.

The respiration is more or less affected; it is embarrassed and hurried, and may become stertorous when the inflammation is very severe, and resemble the state of the same function in cerebral hemorrhage.

The attack of encephalitis does not always occur so markedly as to lead the practitioner to suspect so severe a disease; this is especially the case with children. The child may be dull and restless, with contracted pupil, sensibility to light and sound, and more or less headache; and these symptoms may not attract much attention, until convulsions, or some of the other signs of encephalitis may declare themselves. At other times, signs of inflammatory fever and of cerebral hyperæmia precede those of encephalitis; or violent delirium may be the only indication of its existence. Delirium may, however, exist in conjunction with fever, and yet there may be no encephalitis. In the febrile affections of childhood, which are dependent upon disordered bowels, we frequently observe more or less delirium as ephemeral as the disease of which it forms a part; and in the various forms of delirium, that present themselves in protracted febrile and other maladies, we are not justified in regarding the encephalon as in a state of positive inflammation.

In some cases, encephalitis commences with convulsions or with rigidity—what the French pathologists term *contractures*—or with paralysis in some of the muscles of voluntary motion.

As a general rule, in the first stage of encephalitis, the functions of sensibility are highly exalted; in the second or final stage, the patient sinks into insensibility, coma and paralysis; he is insensible to light and noise, and the pupils are dilated, and incontractile on the approach of light.

The duration of the disease is various. At times, it destroys in a day; at others, it passes through its stages in a protracted manner, and ends in restoration to health or in death, after the lapse of weeks. Occasionally, when most of the symptoms appear favourable, signs of sinking suddenly supervene, as in inflammatory affections of other important viscera; and hence it is important for us to be guarded in our prognosis, unless all the essential symptoms are yielding, and presaging restoration to health.

After the encephalitis has passed away, certain of the functions of sensibility are apt to remain impaired. In children, strabismus, which may be permanent, is observed, and more or less deafness, and hebetude of the mental faculties are generally noticed.

Causes.—These are numerous. External violence frequently occasions it; hence, it is a common consequence of blows or falls on the head, producing concussion of the brain; but it is not necessary that the head should be struck; a fall from a considerable

height on the breech or the feet may equally induce it, and it is important to bear in mind, that the inflammation may not immediately follow the attack, but may supervene weeks afterwards. When, therefore, after a severe concussion, vomiting, with signs of stunning or cerebral confusion, results, the practitioner should keep a watchful eye on the patient, to meet encephalitis, should it appear. Penetrating instruments may likewise induce it, of which the annals of surgery, and especially of military surgery, furnish numerous examples.

A common cause in torrid climes, and one not unfrequent in the temperate regions, is insolation, or exposure to the sun; the patient having perhaps slept in the open air with his head exposed to the rays of that luminary, whence results the *coup-de-soleil* or "sun-stroke" as it is termed.

The use, too, of ardent spirits, may be a cause; and there are many chronic affections of the brain, which may give rise to inflammation of the parts that surround them:—for example, where a clot has been poured out in the brain; or after a cyst has been secreted around it; or, in tuberculous individuals, after tubercles have formed in some part of the encephalon, the neighbouring parts may be attacked with inflammation, excited probably by their presence. In like manner, the presence of tumours in the brain, or of exostosis of the cranium, may sooner or later occasion it. Not unfrequently, too, it is caused by caries of the bones of the ear extending through the petrous portion of the temporal bone, and inducing disorganizing and fatal encephalitis. At times, too, it supervenes on irritating cutaneous affections of the scalp, as the severer forms of *porrigo favosa*, or on the irritating modes of treatment occasionally practised for their removal, as well as on erysipelas of the face, and on inflammation of the eye, of the nasal fossæ, or frontal sinuses; but these last cases are not common. It has been properly remarked, however, that in the cases of erysipelas of the face and the hairy scalp, that are accompanied by delirium, there is not always encephalitis, (*Andral*;) evidence, at least, of this pathological condition has not been presented on dissection.

Encephalitis would appear to have been caused also by irritation of a nerve. A case is recorded in which a ligature applied to a part of the right brachial plexus induced inflammation and suppuration of the posterior part of the left hemisphere of the brain, (*Lallemand*;) and it has been observed as the result of a ligature, which had forcibly compressed the nerves of the arm.

It is likewise connected with diseases of other parts of the system. In the impressible condition, in which the nervous system is in early childhood, it can be understood, that dentition may cause it, and that it may be connected with inflammatory states of other parts, and especially of the mucous membrane of the stomach—the centre of sympathies—as it has been termed; hence, in the exanthemata, affecting, as they do, the mucous membranes, and the whole of the dermoid structure, encephalitis may, and does, form

a not unusual complication. In fevers, too, supposed by some (*Chutterbuck*) to be essentially encephalitis, this pathological state occasionally supervenes, but, as has been already remarked, simple delirium may be present without any other evidence of encephalitis.

Lastly,—among the causes have been enumerated,—excessive study, and any severe mental emotion. These *may* act as causes; but long and close observation has not exhibited to the author a single example of encephalitis having been produced by great mental application alone. Where, indeed, cerebral mischief has resulted at all, it has seemed to be rather owing to collateral irregularities, than to the over-exercise of the brain in its normal operations.

Over-exertion of the intellect on the part of the parent and offspring has, notwithstanding, been suggested as the cause of a greater number of inflammatory affections of the brain now than formerly. It would appear from the bills of mortality of New York, that whilst the population of the city has only quadrupled in the last thirty years, the deaths from inflammatory affections of the head, or from “inflammation and dropsy of the brain” alone, have increased more than twelve-fold. (*Brigham*, of Hartford.) It would appear, that a similar increase has taken place in England and France.

Pathological characters.—These are essentially the same, whatever may be the part of the encephalon affected,—injection of vessels. An eminent observer (*Andral*) thinks it impossible to distinguish the state of inflammation from that of hyperæmia; but, in encephalitis, there are commonly other appearances—the results of inflammation—which enable us to diagnosticate it. As in other parts of the body, the inflammation is attended by tumefaction, and this accounts for many of the symptoms induced by pressure, which are amongst the phenomena already described as belonging to encephalitis. When the inflammation has existed for some time, the anfractuositities between the convolutions of the brain may be found effaced, so that the brain exhibits a smooth and equal surface.

One of the results of inflammation of the neurine composing the encephalon, is softening—the *ramollissement du cerveau* of the French writers, to be described hereafter; and as this softening is always accompanied by more or less injection of vessels, it presents a red appearance, to which the name *ramollissement rouge* or “red softening” has been given.

At other times, ulceration is met with, at others suppuration,—the pus being occasionally infiltrated into the cerebral substance; but at others, again, collected in one or more abscesses.

It has been questioned, whether the neurine can become gangrenous, although some cases of the kind are on record; the sloughy appearance, however, which it occasionally presents in those who have died of encephalitis, may be regarded as analogous to sphacelus, and to the gangrenous condition of the lungs in pneumonia.

Treatment.—As in other cases of severe internal inflammation,

blood-letting is the sheet-anchor of the practitioner; and it must be pushed so as to produce a decided effect—the effect, rather than the amount of blood taken, being the guide;—and, in the course of a few hours, should the disease still persist in its violence, and the patient exhibit the necessary toleration, the operation should be repeated, and again and again, should the extent of disorganizing mischief appear to indicate it. When the practitioner is in doubt as to the farther propriety of taking blood from the system, he may find cupping and leeching of essential benefit.

Nauseating doses of antimonials¹ may likewise be administered with advantage, for the purpose of inducing the action of sedation which nauseants of all kinds excite.

¹ R.—Antim. et potass. tartrat. gr. ij.

Aquæ, ℥vj.—M.

Dose, a tablespoonful, every two hours.

They may be begun with from the commencement of the attack, and be continued until the phlegmasia is got under. Ice may likewise be permitted,—a small portion at a time being taken into the mouth, and suffered to dissolve there. In this manner, the thirst is allayed, the sedative influence of cold is exerted, and there is no risk of the quantity of fluid circulating in the system being speedily restored, as is the case when cold liquids are freely allowed.

Cold may likewise be applied to the head by means of a bladder half filled with pounded ice. This is usually highly agreeable to the patient; but, should it be otherwise, no good effect can be expected from it. The effusion of cold water on the head at intervals, in the form of the douche, from the spout of a teapot held above the head, and at some distance from it, has also, at times, a soothing agency.

It has been remarked, that when the phenomena of reaction have been reduced by a greater or less abstraction of blood, the employment of cold may be had recourse to; but that this should be adopted with great precaution, on account of two inconveniences. If employed before blood-letting, it occasions so powerful a reaction as to resist, perhaps, every effort to reduce it; and, if applied too late, the patient may fall into a state of collapse from which nothing may be able to restore him. (*Andral*.)

In the latter case, there can be no doubt, that the use of cold—even if not prejudicial—cannot exert any salutary operation; but, in the former, the author's experience has not been the same as that of M. Andral. On the contrary, he has found the use of cold internally, as well as applied externally, one of the best sedatives that could be employed, and one admirably well adapted, along with antimonials, to keep down the reaction, that might otherwise have ensued after bleeding; and, accordingly, he is in the habit of employing their conjoint influence.

After the organic actions have been reduced, by the use of the agents above mentioned, various forms of revellents may be em-

ployed with advantage, care being taken, that they do not irritate too much, and in this manner excite the encephalon.

Purgative medicines would appear to be clearly indicated; and they are doubtless at times efficacious, by exciting the different tracts of the intestinal tube, and, in this manner, deriving from the seat of the inflammation; but there is one drawback attendant upon their employment,—that the motion of the body, consequent on their action, is apt to increase materially the sufferings of the patient. Care must, therefore, be taken to obviate this objection as far as possible. One of the best cathartics is the croton oil. Or stimulating injections may be thrown into the rectum.

Cupping and leeching, although they are depletives, and, in this way, sedatives, are likewise revellents. When employed in the former capacity especially, they are generally applied to the temples, behind the ears, or on the nape of the neck; but, at other times, where the joint operation has been particularly demanded, the French practitioners, more especially, frequently apply the leeches around the anus, and the author has often seen marked advantage from this course.

Amongst the revellents must be ranked mercurials, which have, by many, been esteemed powerful auxiliaries in encephalitis, especially in meningitis, as in other inflammations of serous membranes; but their beneficial agency has been denied. In acute encephalitis, it is not easy to affect the system with them, either when given internally, or applied in the form of friction; but in the chronic stage, the new action, induced by mercurials, is often sufficient to break in upon the chain of morbid actions, and accomplish a complete cure.

To affect the system by mercurials, less inconvenience is induced by the internal administration of calomel, than by friction: and alone, or combined with the use of calomel,¹ the cuts made by the scarificator, or the denuded surface from the application of a blister, may be dressed with the stronger mercurial ointment.

¹ R.—Hydrargyr. chlorid. mit. gr. j.
Conserv. rosar., seu
Micæ panis, q. s. ut fiat pilula.
Dose, one, three times a day.

Revellents applied to the skin,—as blisters and sinapisms to the nape of the neck,—are most valuable auxiliaries in the treatment, especially when the excitement has been somewhat subdued by the action of sedatives; and, *à fortiori*, in the latter stages, when the patient has sunk into a state of coma or general paralysis.

Whilst the inflammatory action runs high, it is well not to apply the blister to the shaved head, inasmuch as the irritation excited on the surface of the scalp may be transmitted to the brain and add to the inflammation; but in the after periods, when a typhoid condition has supervened, and it may be desirable to arouse the

organic actions in the encephalon, the surface of the head may be an appropriate place for the application of our revellents.

It is scarcely necessary to say, that the head should be kept raised; and whilst cold is applied to it, sinapisms may be directed to the feet; or, whilst the douche is used in the manner advised above, the feet may be put into a hot or sinapised pediluvium.

Everything, that can disturb the patient, mentally or corporeally, must be carefully interdicted. For this purpose, the chamber should be kept dark; all noise in the house or street be excluded, and total abstinence be enjoined during the active period: the use of ice, as before advised, and of lemonade, or toast water, will at first be sufficient; and, subsequently, barley water, and the diet ordinarily inculcated in inflammatory affections.

2. *Chronic form.*—The phenomena, presented by chronic encephalitis, are strikingly analogous to those of the acute form, and the anatomical characters, presented by it, are much the same. It is to be expected, that on dissection evidences of induration or suppuration may be more marked; and the abscesses have usually had time sufficient to be encysted, or to have a cellular or serous tissue lining them.

Treatment.—The treatment of chronic encephalitis will consist in revulsive bleedings by cupping or leeches, and by general blood-letting, should the symptoms seem to require it. Intermittent counter-irritation or revulsion, by successive blistering to the nape of the neck, applying another blister, after the effects of its predecessor have passed away; and the employment of mercurials, in the manner before recommended, will constitute the main features of the treatment.

The regimen must consist in keeping the head as much as possible elevated, and cool, whilst the feet are kept warm, either by appropriate clothing, or by excitants applied to them.

The diet must be farinaceous,—as arrow root, sago, or tapioca, and gradually, animal food;—the quantity being regulated by the cessation of the disease, and the restored powers of the individual.

2. *Myelitis.*

SYNON. Inflammatio medullæ spinalis, Notamyelitis, Spinitis, Rachialgitis (of some); *Fr.* Myélite, Inflammation de la moelle épinière ou rachidienne; *Ger.* Rückenmarkentzündung, Entzündung des Rückenmarks.

Myelitis or inflammation of the spinal marrow may exist, like other inflammations, in its acute and chronic forms, but they do not differ more from each other in symptoms or treatment than do acute and chronic encephalitis.

Diagnosis.—The spinal marrow, being constituted of columns or tracts for motion and sensation, but not for the higher functions of intellectuality, delirium or perversion of the mental powers is not to be expected. Disorders in the movements are the most striking phenomena, especially when the inflammation attacks the anterior or motor tract of the medulla. In these cases, the effects upon the

muscles are most varied;—spasms or permanent contractions, sometimes of one, at others, of many muscles, with or without paralysis in the parts, which receive their nerves either from the affected portion of the marrow, or from below it. The author had recently under his charge, a female labouring under chronic inflammation of the base of the brain, and probably also of the anterior portion of the medulla. The symptoms, in the first instance, were those of encephalitis—more especially of the left side of the base of the brain; this was accompanied by hemiplegia of the right side: subsequently, the affection of the brain passed over to the right side, and partial hemiplegia of the left side supervened: the spasms and contractions of different muscles were, in this case, marked and distressing. It presented, in addition, all the phenomena that belong to encephalic myelitis. It has been conceived, that when the inflammation is seated in the meninges of the marrow, constituting *spinal meningitis* or *meningeal myelitis*, the symptoms will be more those of irritation of the spinal marrow or of spasm; whilst myelitis proper, or inflammation of the medulla, will be indicated more by symptoms of destruction of the medulla or paralysis, (*M. Hall*;) but the distinction—if it exist at all—is not easily made, and we have not observations enough for the differential diagnosis.

When the posterior tract of the spinal marrow is inflamed, we should expect to find disorders of sensation to be the prominent phenomena. Pain is generally experienced in some portion of the spinal column, which is augmented when the patient moves, or bends the spine, or by percussion: the jar, communicated in this way, is appreciated, but no pressure along the spinous processes can probably aid us in the diagnosis;—as well might we press upon the cranium to discover whether the brain be affected with inflammation.

The pain sometimes extends down the back and the extremities, following the course of the great nervous trunks, and, as in other affections of the nervous structure, it may be continued or intermittent: it is often presumed to be rheumatic or neuralgic, and rheumatic and neuralgic pains are doubtless frequently attributed, most erroneously, to inflammation of the medulla.

At other times, sensation is destroyed in the parts that receive their nerves from the inflamed portion of the medulla, or it may be impaired in the first instance, as indicated by numbness and formication in the fingers, or other portion of the extremities; and these symptoms may go on augmenting, until ultimately there is total insensibility.

The nutritive functions are also disordered in myelitis. At times, there is difficulty in deglutition, the reflux function being affected in the part of the medulla labouring under inflammation, and this may be one of the first evidences of myelitis.

It rarely happens, that the digestive operations are not retarded; and, accordingly, constipation is a common concomitant.

Where the disease is very active, the circulation is greatly affect-

ed, as in other acute phlegmasiæ; but myelitis may exist to a limited extent, and yet the pulse aid little, if at all, in the diagnosis. Commonly, where the upper portion of the medulla is the seat of the inflammation, the respiratory function is disordered; inspiration becomes difficult, or almost impracticable; the diaphragm contracts irregularly and spasmodically, so that the patient is distressed with constant hiccup, and, in this way, asphyxia may be gradually induced.

Where the mischief is seated lower down, and especially if it be chronic, the urinary and genital organs lose their power, so that retention of urine and impotence result. At other times, it is affirmed, the genital organs are greatly excited, with tendency to priapism—facts, which, as has been remarked, confirm certain experiments of physiologists, in which the same effects were induced by mechanically irritating certain portions of the spinal marrow. (*Andral*)

In the pregnant female, there is, at times, inertia of the uterus; whilst, at others, the uterus has contracted well upon its contents, and delivery has been easily accomplished.

After all, it must be admitted, that the diagnosis of myelitis is not easy. The chronic form especially may be confounded with neuralgia, hysteria, and the various phenomena that have been classed by some writers under the head of Spinal Irritation. It fortunately, however, happens, that the revulsive treatment is equally well adapted for all those cases.

The duration of the disease is variable, from a few days to weeks and months; if it be to a slight extent, it may terminate favourably, and commonly does so; but, when violent, the disease is apt to extend to the brain, and to destroy. At other times, as already remarked, it induces asphyxia. In the chronic form, the whole system of nutrition may become impaired, so that the patient falls into a state of atrophy under which he is gradually worn out.

Causes.—The causes of myelitis are of the same nature as those of encephalitis:—blows, falls, or mechanical violence of some kind, may induce it, or it may result from irregularity of capillary action owing to exposure to cold and moisture—like other inflammations.

Pathological characters.—These, also, are precisely identical with those of encephalitis. They are injection, tumefaction, softening, suppuration and induration. The softening and breaking down of the medulla sometimes goes to the extent of destroying its continuity, so that the parts of the body, which receive their nerves from the affected portion of the medulla, or beneath it, are irrecoverably paralyzed. The morbid appearances may extend over the whole marrow; and, at times, even to the brain, so that encephalitis and myelitis may both exist; but more frequently it is partial—cervical, dorsal or lumbar.

The whole substance of the medulla may be found affected, or the appearances may be confined to the anterior, or to the posterior columns; the gray and white substances may be both implicated, but it would appear, that the former is so more frequently. When

the gray substance is softened, and broken down, a canal may be found in the midst of the medulla.

In chronic myelitis, induration is a common morbid appearance.

Treatment.—The same plan of treatment may be used as in encephalitis. When the disease is very acute, blood may be freely drawn from the general system; but, usually, cupping or leeching along the vertebral column is sufficient; and, in this way, we have both depleting and revellent effects. Where the affection is still less active, cupping, without the abstraction of much blood, may be practised as often as the judgment of the practitioner may suggest.

In the chronic form, we trust to revellents almost wholly. Issues and setons were at one time much used, but—since it has been admitted, that the good effects exerted by them are dependent upon the counter irritation, rather than upon the discharge—the intermittent irritation, produced by the moxa, or strong ammoniated lotions, has been preferred; or, blisters are applied to the sides of the vertebral column, allowed to heal, and then repeated. To permanent irritation the system becomes somewhat accustomed, so that it loses its effect; whilst intermittent irritation always makes new—and, in appropriate cases, salutary—impressions.

The following case of myelitis, which has recently passed, cured, from the author's care, will elucidate the method of treatment.

A man, 34 years of age, at the time when he came under treatment, was unable to walk without the aid of a cane. About 15 months previously, he was suddenly attacked with loss of power of motion in the right leg, for which he used various stimulating liniments, and recovered, in the course of a few months, so far as to be able to resume his ordinary occupation.

In a short time afterwards, his left leg became similarly affected; and diminution of motion and sensation existed, extending up as far as the hip. He now applied to a physician, who made use of the actual cautery to the lumbar region and along the course of the spine, which gave but temporary relief.

On the 3d of August, 1839, he fell under the author's care; when he was immediately put upon a revellent treatment. The oil of turpentine¹ was given internally to produce a derivative action on the kidney, and moxas were applied to the lumbar region, where the nerves branch off from the spinal cord.

¹ R.—Olei terebinth. gtt. xxx.

Mucilag. acaciæ, ℥ij.

Aquæ cinnam. ℥iv.—M.

Dose, a fourth part, four times a day.

The moxas were repeated every other day, and on the 14th of August he had experienced much relief from them: still the pain was not wholly gone. He was then ordered the lotio ammoniata fortior¹ of Granville;—a piece of flannel being soaked in it and applied on each side of the spine for five or six minutes, by which vesication was affected, and with immense relief; this was repeated

a few days afterwards, and, on the 7th of September, he was discharged entirely cured.

¹ R.—Liq. ammon. fortiss. ℥x.

Spirit. rosmar. ℥ss.

—— camphor, ℥ij.—M.

For the formation of these constituents of the prescription, as well as of the moxas mentioned above, see the author's *New Remedies*, p. 468, and p. 572, Philad. 1839.

Along with other revulsives in chronic myelitis, douches of tepid or cold water may be applied over the vertebral region; and in both the acute and chronic forms, cathartics may be administered with the view of inducing their revellent influence.

As regards the diet;—in the acute form it must be regulated as in acute encephalitis; in the chronic form, it must be moderate and free from every excitant admixture: the patient must be kept in the horizontal posture, and in perfect mental and corporeal quietude.

b. Inflammation of the membranes of the nervous centres.

SYNON. Meningitis; *Fr.* Méningite, Inflammation de la Membrane séreuse céphalo-rachidienne.

Inflammation of the meninges of the brain, including, as already remarked, the dura mater, arachnoid, and pia mater, has received great attention from modern pathologists, and for a time, it was maintained, that their diseases could be readily diagnosticated from those of the neurine which they invest. Almost all the cerebral affections—from the slight convulsions of infancy, to the mental alienation of the adult, in accordance with the views of certain pathological writers, (*Parent, Martinet, Lallemand, Gendrin, Coindet,*)—were considered to be arachnitis or inflammation of the arachnoid. (*Piorry.*) When, again, it was recollected, that the pia mater is in immediate contact with the brain, and that it presents the greatest vascularity, and is frequently the seat of lesions, whilst the arachnoid remains transparent, it was regarded as the main seat of many cerebral diseases. The dura mater—a fibrous membrane—being rarely affected except by fungous tumours, ossification and adhesions,—is, by common consent, regarded as but little implicated in disease.

It must obviously, however, be a matter of extreme difficulty to decide upon the precise membrane that is affected: indeed, it rarely, perhaps, happens, that they are diseased singly; and still more rarely, that the part of the brain in contact with them is not implicated also. (*J. Hope.*) “In our days,” says a recent writer, (*Piorry,*) “the idea is entertained, that practically it is always exceedingly difficult, to say the least, to tell precisely, during life, what is the cerebral membrane principally concerned; and we need not hesitate to go farther, and to assert, that it is equally impossible to determine, whether it be the meninges themselves that are diseased, or rather the portion of the brain in contact with them. I am well aware, that pathological anatomy finds more lesions in the menin-

ges than in the brain, but this is owing to the different textures of the parts;" and he concludes, "that meningopathy or disease of the meninges cannot be isolated from superficial encephalopathy or disease of the surface of the brain."

Some writers, indeed, go farther than this, and affirm, that our knowledge is not sufficiently matured to enable us to say with confidence, what symptoms indicate inflammation of the substance of the brain as distinguished from that of its membranes, (*Abercrombie*;) and hence, encephalitis and meningitis have not unfrequently been treated as a single affection. (*Georget*.)

These remarks are strictly in accordance with the author's observation; and hence, as suggested by M. Piorry, the disease is less meningitis than *meningo-cephalitis* or inflammation of the membranes and brain.

1. *Acute Meningitis.*

Diagnosis.—The symptoms usually assigned to this affection are the following:—Generally, there is pain of a more or less acute character in different parts of the head; commonly, towards the forehead and the parietal regions; and, occasionally, at the top of the head, and along the sides of the median line. The character of the pain varies; in some, it is the feeling of an enormous weight on the cranium; in others, of violent shootings, either continuously or in paroxysms. At times, the pain is so violent, that the slightest noise or movement of the body excites the most intense suffering. In one hundred and four recorded cases, cephalalgia was noted seventy-eight times. (*Parent-Duchatelet, Dance, Andral*.) It would not, therefore, appear to be a universal concomitant, and consequently, a diagnostic symptom.

It has been remarked by one distinguished observer, (*Andral*), that, in some cases, the pain was augmented by the slightest pressure on the scalp; but, as a general rule, this is an indication rather of the neuralgic than of the inflammatory headache, and it has been as categorically affirmed by another eminent author on diagnosis already cited, (*Piorry*), that the pain is *not* augmented by pressure on the integuments.

Along with the violent headache, there is increased heat of the integuments of the head, and of the surface generally; delirium, more or less violent, and at times furious; with spasmodic or tetanic contractions of the muscles of the head and trunk; contraction and dilatation—at times continuous, and at others successive—of the pupils; with, occasionally, more or less deviation of the eyes. Most commonly, however, the pupil is contracted during the early period of the disease; and, in the advanced stage, especially if effusion has taken place into the ventricles, the pupil is permanently dilated; the iris not responding to the light, and vision being wholly abolished. Similar observations are applicable to the hearing, which is generally painfully acute at first, and more or less depraved or

perverted; and may, subsequently, be greatly impaired or wholly destroyed.

It is admitted, however, that these various alterations of sensibility in acute meningitis are neither constant, nor necessarily associated with the existence of any particular form of the disease. (*Andral.*)

In almost all cases, there is great delirium. It is, indeed, the most constant of the symptoms. It varies much in character, being sometimes violent; but, at others, moderate, as in other encephalic diseases, of which delirium is so constant a symptom. It rarely appears at the commencement of meningitis, being preceded by the headache in the vast majority of cases.

Occasionally, but rarely, coma exists at the early period of the disease. More commonly, the delirium subsides into this alarming condition, which is often symptomatic of effusion into the ventricles.

Along with these functional phenomena, there is almost always great restlessness, which is often general, but at times confined to particular parts of the body,—as to one upper or lower extremity, or to the head, which is continually tossed from side to side. At other times, subsultus tendinum, and general or partial tremors are present; and convulsions are esteemed to be one of the most common phenomena. These may be general, or partial, but more frequently the last, and they affect especially the eyeballs, eyelids, face, lips, and extremities. The tongue is, also, occasionally affected with convulsions, and grinding the teeth is a common phenomenon.

Tonic spasms are also witnessed,—for example, permanent flexure of the forearm on the arm, which may occur in both sides at once or in one only; or the head may be thrown back or to one side, and held there permanently. Occasionally, too, tetanic stiffness is observed in the neck, trunk or limbs,—with, at times, trismus, and permanent curvature of the body to the right or left. (*Andral.*)

Along with these symptoms, immediately dependent upon the local lesions, the organic functions are more or less concerned; but their condition does not differ from that which we notice in encephalitis, and, indeed, in inflammation generally.

The distinguished pathologist, just cited, (*Andral*), considers that acute meningitis usually observes three periods,—in the *first*, there is headache, vomiting, and frequently pyrexia; the *second*, is characterized by delirium and different disorders of motility; and the *third*, by coma, and a state of collapse, more or less profound; but it is obvious, that these characters are totally inadequate to distinguish meningitis or meningo-cephalitis from encephalitis, and the fact corroborates the remarks already made in regard to the insufficiency of all the functional phenomena to indicate the precise part of the encephalon, which is affected with meningitis.

It has been the custom with most of the English and American writers, to separate the consideration of *Hydrocephalus acutus*—*Encephalitis exsudatoria*; Ger. *Hitzige Hirnwassersucht*,—as it

has been somewhat unfortunately termed, from meningo-cephalitis, which it really is, and sometimes of an exceedingly acute character, requiring the most active treatment; but, at others, more subacute, and connected with the development of tubercles, constituting *tubercular meningitis*. Most of the more modern French and German pathologists, consider it more properly under meningitis; and it is certain, that all the symptoms, which have been considered to denote the presence of effused fluid, may exist, and yet there may be no fluid effused.

This form of the disease generally occurs in young children, and its presence may be suspected by the existence of the ordinary signs of encephalic inflammation. During the first days, the child generally vomits,—a symptom, which almost invariably accompanies all serious affections of the encephalon; and the occurrence of which causes the surgeon to watch a case narrowly, where a severe blow has been received on the head, in order that he may meet any symptoms of cephalitis as they present themselves. Sooner or later, the child exhibits signs of stupor, lies, perhaps, more or less comatose, and shrieks out in his sleep, or at the moment of awakening; the eyes exhibit more or less convulsive movement; and frequently they are turned upwards and fixed on the ceiling; the face is alternately flushed and pale, and there are often marked remissions in the febrile phenomena.

Attempts have been made to judge, from the particular symptoms, of the precise part of the meninges that are affected. Some (*Parent-Duchatelet, Martinet, Lallemand, Bayle,*) have conceived, that when meningitis affects the surface of the hemispheres, it is chiefly indicated by pain in the frontal or parietal region, and by delirium, and greater or less derangement of the mental faculties;—the delirium indicating the period of active inflammation; and the abolition of the mental faculties at a later period, the destruction or compression of the gray substance of the brain by effused fluid.

Meningitis of the base of the brain, from the orbital arches backwards, is conceived to be characterized mainly—by muscular contractions of the trunk and eyes, throwing the head backwards, change in the shape and movement of the iris, grinding of the teeth, stupor broken by convulsions; and, at a later period, loss of all sensation.

Meningitis of the ventricles, is considered to present the greater part of the preceding symptoms, and, in addition, more speedy disturbance of vision, with phenomena of cerebral compression.

Notwithstanding the assertion of those who believe, that the meningitis of the different parts of the encephalon may be diagnosed by the symptoms described above; it is but too true, that it is almost impossible to pronounce positively during life on this matter, and this is the view embraced by the best pathologists. (*Andral, Piorry.*) Fortunately, this is not a matter of moment in practice; meningitis—no matter where situate—requiring precisely the same treatment.

The duration of meningo-cephalitis is very variable. At times, it terminates fatally in about a week; but, at others, not until the end of three or four weeks. It need scarcely be said, that it is always a serious affection; although often much under the power of the therapist, if he be called early, and meet it in an appropriate manner. The form of the disease, however, which is tubercular, is of most unfavourable prognosis.

Causes.—These are essentially the same as those of encephalitis. A predisposition would appear, however, to be laid in the tuberculous and the scrophulous diatheses. It is certainly more frequent in infancy than at any other period; and it has been affirmed, that girls are more liable to it than boys.

Meningitis, it is said, prevails epidemically in certain years, and at certain seasons; whilst it is at other times uncommon for a long period. An epidemic of this kind prevailed during the first months of the year 1841, at Versailles, Rochfort, Metz, and Strasburg. A narrative of the disease, in the last town, has been published, from which it appears, that after having reigned exclusively amongst the soldiers of the garrison, the inhabitants of the city became affected. During a period of four months and a half, forty patients were admitted, of whom twenty-one died. (*Wunschendorff*.)

Meningitis would appear to be more common in spring and autumn, than in winter or summer. (*Andral*.) It is affirmed, too, to supervene occasionally during the existence of phlegmasiæ of the serous membranes. (*Foville, Andral*.)

Pathological characters.—It rarely happens, that the dura mater exhibits evidences of active inflammation except in traumatic cases, when all the ordinary pathological appearances may be met with. Occasionally, pus is found effused between it and the skull, or between it and the arachnoid. In cases in which the inflammation has continued longer, tumours are sometimes observed, and heterologous formations of various kinds. Bony points are not unfrequently found in different parts of it, and especially in the falx cerebri.

By far more frequently, morbid appearances are observed in the arachnoid, and this is a reason, why arachnitis is considered by some to be almost as extensive in its signification, judging from observed phenomena, as meningitis.

Under the membrane, there may be more or less effusion of a turbid, milky, serous fluid containing purulent flocculi; or false membranes, which may or may not have become organized, may be seen investing one of its free surfaces, or passing, in the form of firm bands, from one part of it to another. It is remarkable, however, that the membrane itself does not become injected, changed in colour, or thickened. (*Andral*.) The effusions of serum or of pus—as the result of arachnitis—are more seen in the ventricles, than in the “great cavity of the arachnoid.”

The morbid appearances of the pia mater are, however, much more common than those of either of the other meninges. Besides

being the seat of infiltration of serous fluid or of pus, it may be greatly indurated, and adhesions may form between it and the arachnoid, particularly where the arachnoid passes from one convolution to another. Cartilaginous, osseous, tuberculous, and other formations, may likewise be met with.

These morbid appearances may be found in any part of the encephalon or spinal marrow. Of late years, the meningitis, that occurs so frequently in young children, and is generally designated as *hydrocephalus acutus*, has been ascribed to a deposition of tubercular granulations on the under surface of the cerebral layer of the arachnoid membrane, and has been regarded as essentially strumous in its character; (*Guersent, Dance, Gerhard*, of Philadelphia, *Rufz, Becquerel, P. Hennis Greene, Schweninger*;) and there can be no doubt, that many of the cases are of this character. "It was not known," says Dr. Gerhard, "previously to the researches of Dr. Rufz and myself, that the tuberculous character of the disease was anything but a mere complication. Thus far the researches of Dance had extended, and it was taught by M. Guersent at the children's hospital, that the granular, or (as we now term it) tuberculous meningitis, was a variety of the disease. The physicians and students, who had followed the practice of the children's hospital, had of course become familiar with the fact, that tubercles were occasionally found in the pia mater; and this circumstance, which was well known to M. Constant, as well as to others, led a physician, who assisted in preparing his notes upon this subject, to claim a priority, which he himself would have been too conscientious to have asserted while living."

Treatment.—This is essentially the same as that advised in encephalitis—blood-letting general and local, carried at times to a great extent, (*Maxwell, D. Davis*;) the application of ice and of the cold douche to the head, whilst the feet are placed in sinapised pediluvia; cathartics; antimonials given so as to nauseate; blisters after the activity has been reduced; and mercurials. Some have esteemed the last agents, used in the way of friction, to be almost specific in cerebral inflammation, (*Odier, Coindet, Delpech, Lié-gard, Barré, Guersent, Mazade*;) but a modern writer, (*Andral*,) asserts, that he has never seen any great effect induced by them, whether given internally or administered in the way of friction. Where benefit has been witnessed from the administration of calomel—which is the article usually given—he thinks it is ascribable rather to its acting as a cathartic than as a mercurial.

In the last stages, where coma has supervened, and there is reason to suspect the existence of effusion into the cavities, mercurials, pushed so as to touch the mouth slightly, and blisters, are the agents on which the greatest reliance has to be placed.

The cold douche has generally been regarded as best adapted to the earlier stages of meningitis; but a recent writer, (*Münchmeyer*,) advises it at a later period of *hydrocephalus acutus*, when effusion, the consequence of inflammatory action, has taken place, and a

tendency to paralysis exists. After the subsidence of the violent symptoms of the disease, and when the patient has sunk into a comatose state, with a pale countenance, occasionally suffused with a flush, dilated pupils, strabismus, and slow pulse, he has found the revellent action of the cold douche, poured on the patient's head for a minute or two, in a moderate stream, from the height of five or six feet, of excellent service.

The immediate effect of the cold affusion has been, that the patient has awoke from his comatose condition, and begun to cry violently, which he has continued to do so long as water was poured upon him. He has afterwards appeared exhausted and pale, the skin being cool, the pulse small and very frequent; but, when placed in bed, he has fallen into a doze, the pulse has become more regular, and the warmth of the surface has returned.

In the subacute form of meningitis, less activity of treatment is necessary; but the main management is the same as in the acute.

When the inflammation has been subdued, it is important to place the patient on low diet, for a long time; to keep the head cool, the hair short, and to prevent indulgence in intellectual exertion, and over-excitement, both mental and corporeal;—in short, to shun all sources of excitement, as the disease is very apt to recur.

Acute meningitis of the spinal canal—méningite rachidienne, (Piorry,) is very rare, and especially so as a distinct affection from that of the encephalon. It is described as being characterized by throwing the trunk backwards, by *contractures* or convulsions of the limbs, pains in the vertebral canal and in the limbs, with preservation of the intellectual faculties, when the meninges of the brain are not inflamed simultaneously. (*Andral.*)

The treatment is the same as in meningitis of the brain and cerebellum.

2. Chronic Meningitis.

This is not a common affection, and is said to have been well observed only in the insane hospitals. (*Andral.*) It may be primary, or the sequel of the acute form.

Diagnosis.—After symptoms of cerebral hyperæmia, or of acute meningitis, cephalalgia is experienced, with more or less intellectual derangement, and irregularity in the movements, so that the patient staggers—symptoms, which may continue for weeks and even years. In the second stage, the delirium is more general, and there is always extreme agitation, and desire for motion; but the movements become more embarrassed. In the third stage, the intellect is wholly annihilated; all power of motion is lost, and paralysis results, which may be general or partial. The patient is then in a complete state of immobility, in which the muscles are atrophied; the nutritive functions now become greatly disordered; and progressive emaciation, diarrhœa, and more or less bronchial irritation commonly supervene. The duration of the disease varies from one

to several months, or even years. Of 151 cases, observed at Charenton, 65 lasted from a month to a year; 81 from one to six years; and 5 from six to twelve. (*Andral*.)

Causes.—Chronic meningitis is said to attack males more frequently than females. It would seem to have been rarely seen in infancy. (*Andral*.) It is also uncommon between the ages of 20 and 25; but more so between 25 and 30; and attains the maximum of frequency at from 30 to 50. As in insanity, a predisposition to it would seem to lie in organization, as it appears in some families more than in others, and in the children of parents who have suffered from it. It is sometimes induced by powerful emotions; and—it is affirmed—by the abuse of alcoholic liquors. (*Andral*.)

Pathological characters.—These are often the same as those of acute meningitis—redness, thickening, effusion of various fluids; false membranes establishing adhesions in different places; and, occasionally, cartilaginous, osseous, and other depositions. As it generally terminates by the supervention of some other disease,—apoplexy, encephalitis, acute meningitis or softening,—the evidences of the complication will be manifest on dissection.

Treatment.—This is simple, but unhappily of little efficacy. Blood-letting—if used at all—can rarely be required from the general system, unless at the very onset of the disease; and then local blood-letting by cupping is preferable. Later on in the disease it cannot often be necessary. Revellents—as blisters to the nape of the neck, or a seton, or repeated applications of the moxa, with occasional brisk cathartics—constitute the essential part of the management. In protracted cases, where the circumstances will admit of it, change of air, with appropriate exercise, and careful moral management, as advised under Insanity, afford the best prospects of relief.

III. ANÆMIA OF THE NERVOUS CENTRES.

SYNON. *Fr.* Anémies des Centres Nerveux.

The term *anæmia*—as elsewhere shown—has been applied, not to a total loss of blood in any part, for such a condition never can exist, but to paucity of blood—what has been also termed *oligæmia*. In the sense in which it is used here, it means a great diminution in the quantity of the blood itself, or of its fibrine and red particles, and it is a pathological condition of deep interest, inasmuch as the symptoms, induced by it, may strikingly resemble those that are caused by hyperæmia. At one time, indeed, coma and convulsions were looked upon as unquestionable evidence, in all cases, of congestion of the encephalic vessels; but it is now known, that coma may exist independently of any polyæmia or hyperæmia of the encephalon; that it is occasionally induced by a condition the opposite to those, and that the administration of excitants may be required for the removal of symptoms closely resembling such as are treated, and treated satisfactorily, by bleeding and by ordinary depletives. The same may likewise be said of convulsions.

Anæmia of the nervous centres may exist along with general paucity or impoverishment of the blood; or it may be produced by long protracted disease, or by great loss of the vital fluid. At times, too, it occurs in acute diseases, as in scarlatina, in which, owing to hyperæmia occurring in other organs, there is a deficiency of blood in the vessels of the brain.

Diagnosis.—If we bleed an animal to death, we find, that after a certain quantity of blood has been discharged, it begins to totter, falls, and is attacked with convulsions similar to epilepsy. The same thing may occur in man, if the abstraction of blood be carried to too great an extent, or if it be too frequently and largely repeated; and the experiments of a distinguished surgeon, (*Sir A. Cooper*,) showed, that the tying of the two vertebral arteries in animals brought on various species of paralytic as well as spasmodic affections.

Very recently, two cases of cerebral hemorrhage—cerebral apoplexy—have been published, which occurred in females recently delivered, and who had been rendered anæmic by profuse uterine hemorrhage. (*Laurent*.)

We can thus understand, that if anæmia should arise from any cause, convulsions may be the consequence; and it seems equally clear, that coma may supervene from the same condition of the encephalon. It is, however, in children, that we most commonly meet with cases of the kind now mentioned, which it is not very easy to distinguish from hyperæmia. As a general rule, it may be laid down, that heaviness and drowsiness in children are dependent upon the latter pathological condition, and may be relieved by appropriate depletion; but if the child be drowsy, and at the same time feeble, cool or cold, with a quick, weak pulse, we have reason to infer, that there is a state, which may be aggravated, and perhaps hurried to a fatal termination, by blood-letting and other depletives. Most of the symptoms, indeed, of inflammation of the brain, may be induced by exhaustion—giving rise to the *hydrencephaloid disease*, or *spurious hydrocephalus*, as it has been termed. (*M. Hall*.)

In like manner, where convulsions occur in childhood with signs of increased vascular action, and determination towards the encephalon, the pathological state may be very different from that in which the same morbid phenomena are displayed along with a pale, cool surface and feeble circulatory powers,—a form of convulsions, which is, perhaps, most commonly met with.

As remote effects of the excessive loss of blood, we have great reaction, which may, indeed, frequently supervene in a few hours—as in the case of a parturient female, who has been almost drained of blood, and yet who may, in a short time afterwards, labour under the most rending headache, with flushed face, throbbing of the carotids and temporals, which symptoms are not to be allayed by farther depletion, but can be immediately reduced by a full sedative dose of an opiate.

At times, in similar conditions of the encephalon, we meet with great cephalalgia, or sense of pressure in some part of the head, with intolerance of light and sound, sleeplessness, slight delirium, with or without palpitations;—most of these indicating an inflammatory or hyperæmic condition of the encephalon, and yet all being aggravated by depletion even when carried to a slight extent only. The author has elsewhere (*General Therapeutics*, p. 399, Philad. 1836,) alluded to an interesting case of this kind, which he attended with his friend Dr. Smith of Baltimore, then his colleague in the University of Maryland. A similar condition of the encephalon is met with in long protracted fevers, especially of the typhoid kind.

Causes.—These will be understood from what has been already said. Attention, however, has been directed recently to affections of the brain, which are induced by a deficient supply of blood to the organ owing to disease either of the sigmoid or mitral valves, (*Corrigan, Robert Law*;) hence arises softening of the brain, a condition, which, Dr. Law thinks, is identified—by the circumstances under which it takes place—with gangrene or death of a part consequent upon diminution of its due supply of blood, and to require a mode of treatment very different from that which is indicated when there is an excess of blood in the brain.

Pathological characters.—The encephalon may be found pale, and the vessels containing an unusually small quantity of blood. The gray substance, it is affirmed, exhibits this appearance more frequently and decidedly than the white. As the blood, too, in anæmia, does not contain its usual proportion of fibrine and red particles, an effusion of watery fluid may be found at the surface and base of the brain, or in the ventricles, which may have taken place before dissolution, or be a transudation after death.

Treatment.—In the difficulty, which sometimes exists in the differential diagnosis, the practitioner will have to be cautious, both in the use of depletives and of excitants. He must cautiously feel his way; but if the surface be cool, and the powers of the circulation feeble, gentle stimulants—as small quantities of wine-whey, may be advisable; revellents—as sinapisms—may be applied to the pit of the stomach; and, when signs of reaction come on, the excitants must be withdrawn. For the removal of the remote symptoms induced by loss of blood in the adult, narcotics, as before remarked, in sedative doses, may be found highly beneficial.

R.—Morphiæ sulph. gr. iss.

Aquæ cinnam. ʒj.—M. et fiat haustus, vel

R.—Pulv. opii, gr. iiss.

Conserv. rosar, q. s. ut fiat pilula.

The patient should be kept in a warm chamber, and in the horizontal posture; and small quantities of nutriment, in the shape of arrow-root, or of any of the amylaceous articles of diet, or panada, may be cautiously administered.

IV. HEMORRHAGE IN THE NERVOUS CENTRES.

SYNON. *Fr.* Hémorrhagie des Centres Nerveux.

This affection has been generally designated by the term *Apoplexy*—*Apoplexia*, *Carus apoplexia*, *Apoplexia sanguinea*; *Fr.* *Apoplexie*, *A. sanguine*, *Hémorrhagie cérébrale*, *Hémo-encéphalorrhagie*, (*Piorry*;) *Ger.* *Schlagfluss*, *Blutschlagfluss*;—but they cannot be esteemed synonymous, as remarked under the last head. All the signs of apoplexy may, indeed, be present without hemorrhage; and, on the other hand, hemorrhage may occur without the ordinary symptoms of apoplexy. (*Andral*.)

Hemorrhage in some part of the encephalon is by no means uncommon; and this is probably owing to the encephalic vessels not being well supported by the parts in which they creep, so that transudation readily takes place through their parietes; for it is very rare for hemorrhage, in these cases, to be induced by rupture of a vessel; at least, no such appearances present themselves on dissection.

Hemorrhage may take place in different parts of the nervous centres—either at the external surface, in the cavities, or in the substance of the nervous matter.

Every part of the nervous centres is not equally liable to be affected by hemorrhage. When it occurs from the meninges of the brain, it may be seated between the dura mater and the skull; between the dura mater and the arachnoid; in the cavity—as it is termed—of the arachnoid; in the meshes of the pia mater at the periphery of the hemispheres, or in the ventricles; and it may exist alone, or along with cerebral hemorrhage. (*Andral*.)

The symptoms, in such cases, will be those of compression—that is sudden loss of sensation, volition, and mental and moral manifestation. It has been ranked as a form of apoplexy, and termed *meningeal*; *Fr.* *Apoplexie méningée*. (*Serres*.)

The effusion takes place most frequently in the very substance of the brain. Of 386 cases, which have been published, the hemorrhage was seated in the part of the cerebral hemispheres, situate on a level with the corpora striata and the optic thalami, and at the same time in both those bodies, in - - 202 cases.

In the corpora striata, in	-	-	-	61
In the optic thalami, in	-	-	-	35
In the portion of the hemispheres above the centrum ovale of Vieussens, in	-	-	-	27
In the lateral lobes of the cerebellum, in	-	-	-	16
Anterior to the corpora striata, in	-	-	-	10
In the mesocephalon, in	-	-	-	9
In the spinal marrow, in	-	-	-	8
Behind the optic thalami, posterior lobes, in	-	-	-	7
In the median lobe of the cerebellum, in	-	-	-	5
In the peduncles of the brain, in	-	-	-	3
In one peduncle of the cerebellum, in	-	-	-	1
In the corpora olivaria, in	-	-	-	1
In the pituitary gland, in	-	-	-	1
In the central white parts,	-	-	-	0

Although such is the record of cases given, (*Andral*;) hemorrhage is frequently met with, both in the white and the gray portion of the encephalon. In a case of profuse hemorrhage, which was lately examined by the author, and which was caused by severe concussion received from blows and a fall down stairs without fracture, the white portions of the hemispheres, above the level of the centrum ovale of Vieussens, were found torn in many places; and the cavities, thus formed, were filled with coagulated blood. It will be seen, however, from the above table, that hemorrhage above the centrum ovale of Vieussens is by no means common.

In other cases, the superficial portions of the brain are the seat of the infiltrations; and we notice the effusion more especially in the anfractuositities.

Hemorrhage into the cerebellum is much less frequent. Of the 386 cases of hemorrhage in the nervous centres given above, it occurred but 16 times. It is chiefly observed in the lateral lobes. Next to the cerebral hemispheres, it is most frequent in the mesocephalon. It has been rarely met with in the crura cerebri, or crura cerebelli; nor is it common in the spinal marrow.

When the extravasation of blood has taken place into the ventricles, it has been presumed, that it may be owing to laceration of the cerebral substance; and in the form of "meningeal apoplexy," described by M. Serres, that the hemorrhage may have occurred in the pulp, and the blood subsequently have transuded through the membranes, (*Andral*;) but there seems to be no reason, why transudation might not take place through the vessels of the meninges in both cases, under favourable circumstances; whilst it must be admitted, that the transudation would be more easy into the substance of the encephalon, owing to the parts affording less support, and, therefore, admitting of more ready congestion, and consequent transudation.

The quantity of blood effused varies extremely at times; it may not amount to more than the size of a pea and even less, and yet all the symptoms of hemorrhage may be well developed; whilst in other cases, the effusion may be to a greater extent, and the signs be entirely equivocal. It may have taken place, also, in various parts of the brain, so that there may be a multitude of small cavities containing liquid or coagulated blood; all of which may have occurred at the same or different periods.

The appearance of the effused blood is very different, according to the time that may have elapsed since the hemorrhage. At first, it is an ordinary clot, with more or less fluid matter surrounding it, according to the condition of the blood at the time; but soon the colouring matter disappears; and a delicate cellular tissue is formed around the clot from which a serous fluid is secreted, which softens the clot, and favours its absorption; until, ultimately, the only evidence of previous hemorrhage may be the existence of the *apoplectic cell*, as it has been termed; or, the sides of the cellular

membrane may come together, so that the evidences of hemorrhage may be effaced.

The blood, as already remarked, is usually effused by transudation through the capillary vessels, but, in very rare cases, it supervenes on the rupture of a vessel.

At times, in the seat of the hemorrhage an accidental tissue is observed, owing to the plastic lymph of the blood having become organized and overrun with vessels; in these cases, the symptoms have been those of apoplexy, and the patients have remained hemiplegic.

Effusions of blood into the nervous centres must generally be connected with the condition of the containing vessels; sometimes, they have been observed to present a varicose appearance; and, at others, to be studded with osseous patches.

They are doubtless, also, intimately associated with the state of the nervous substance in which they creep: frequently, this is found softened, and from the symptoms the softening probably preceded the hemorrhage, and was a great cause of it, owing to the diminished support it afforded to the vessels: at other times, the softening would appear to have been consecutive.

The colour of the nervous substance around the effusion is commonly changed. It may be more or less red, or livid;—partly owing, perhaps, to some degree of injection of its vessels, to effusion of blood from them, or to simple imbibition. Occasionally, especially in old cases, the surrounding portions of the brain are indurated; and, at times, inflammation has occurred in them, which has terminated in abscess.

Diagnosis.—Many of the symptoms are precursory, and indicate the state of hyperæmia or congestion before described; but occasionally these are entirely wanting. When once, however, the hemorrhage has taken place, the compression of the cerebral substance, caused by it, commonly induces symptoms, which cannot be mistaken. These are, loss of sensation, motion, and mental and moral manifestation.

Prior to the hemorrhage, there may be headache, vertigo, and confusion, with numbness or sense of creeping in some part of the surface, and especially in that of the fingers or toes; with depravation of vision, the appearances of sparks or black spots, cobwebs or flashes of light, and more or less depravation of hearing,—tinnitus aurium or susurrus,—and of smell and taste; but the two last senses rarely afford any functional phenomena that can guide us. These various symptoms exist in congestion, and they may be present for days and weeks, and even longer; but when hemorrhage has once taken place, the depravation or impairment of sensation terminates in its more or less entire abolition.

When the attack has been sudden, we may in vain attempt to arouse the individual to sensation; and as the immediate apoplectic effects pass away, the sensibility of the limb, affected with loss of

motion—which we shall find is one of the permanent results of encephalic hemorrhage—generally continues impaired; sensation, too, in the paralyzed portion of the body, is usually sooner restored than motion. Long before anatomical and physiological researches had discovered that the voluntary muscles are supplied with nerves both of motion and sensation,—distinct, although enveloped in the same nervous sheath,—pathology had indicated their independence, although unable to explain the phenomenon.

In severe cases, not only the encephalic but the true spinal nerves lose their impressibility, so that the contact of any body with the lining membrane of the mouth, or of the œsophagus, induces no muscular contraction; the sphincters, too, which belong to the true spinal system in their nervous relations, lose their power, so that the contents of the various reservoirs are discharged involuntarily.

The conjunctiva, which receives the fifth pair of nerves—a nerve endowed with the power of communicating both sensation and motion—is, at times, rendered insensible, so that the contact of the finger induces no irritation.

At first, the sight may be entirely destroyed; but, as sensation returns, it may remain lost or be impaired in one eye only. This will usually be the eye of the paralyzed side; but cases are on record, in which the eye of the opposite side has suffered. Such, however, have not fallen under the author's observation.

Much dispute has arisen as to whether the optic nerves decussate, or simply come in contact at the chiasm; and the author has elsewhere shown, (*Human Physiology*, vol. i. p. 187, 4th edit. Philada. 1841,) that pathological cases have been adduced on both sides of the question, but that experiment would appear to be in favour of decussation. Some, however, of the most respectable physiologists maintain, that the decussation is partial, and concerns only the inner portions; that the others—the outer—proceed onwards through the optic thalamus to the eye without any crossing. Under this view, cases of hemorrhage may produce loss of vision of the same or of the opposite side, according as the effusion implicates the portion of the nerve, the prolongation of which simply touches or crosses at the chiasm.

It has been affirmed, (*Serres*,) that one condition of loss of vision is, that the extravasated blood shall be on the level of the commissure of the optic thalami; the upper portion of those ganglions, M. Serres asserts, might be affected without blindness resulting. (*Andral*.)

Loss of motion or *Paralysis*—*Carus paralysis*, *Resolutio nervorum*, *Palsy*; Fr. *Paralysie*; Ger. *Lähmung*, *Paralyse*,—is the almost universal effect of hemorrhage in the nervous centres. It has been before shown, that general paralysis may result from hyperæmia of the nervous centres, which passes off as the hyperæmia yields. The paralysis, however, which follows hemorrhage, generally comes on suddenly, concerns one half the body, and remains more or less for the rest of the patient's life.

In rare cases of cerebral hemorrhage, there is no paralysis. A recent writer (*Andral*) refers to two cases, which, he says, are all that he knows. One of these was observed by M. Lenormand in the service of Laënnec; and another was cited in 1827, by M. Secrétin in an inaugural thesis. In the latter case, the person died without presenting any derangement of motility; and, on dissection, a clot, of the size of a hen's egg, was found at the posterior portion of the right cerebral hemisphere.

To these cases we may add a third. Mr. T——, a gentleman of Baltimore, was affected with a singular train of cerebral symptoms; loss of sensation, volition, and every mental and moral manifestation, with twitchings of the muscles of the limbs: from these he recovered by copious blood-letting, which left, however, a high degree of impressibility, and tendency to relapse into the same condition: relapses did, indeed, take place for a short time, on two or three occasions, but he ultimately regained all his faculties. The symptoms were ascribed to hyperæmia of the encephalon, and no idea existed that hemorrhage had occurred. Soon after one of his last attacks, the author was surprised to meet him in the street, when he expressed himself to have entirely recovered. On the same day, however, notwithstanding the cautions given to him, he took a hearty supper, and a bottle of porter. In the night, the family were aroused by moanings proceeding from his chamber, when he was found in a condition of deep apoplectic coma. Blood was drawn from his arms, but it was evident, that all remedies must be vain, and, in the course of a few hours, he sank.

On opening the brain, the meninges and cerebral substance were found much injected, and several ounces of blood were effused at the base of the brain, and on the mesocephalon. In the left corpus striatum, there was the appearance of previous hemorrhage: the greater portion of the colouring matter was absorbed, and extensive softening existed around the clot.

This was evidently the lesion, that had given rise to the symptoms from which he had recovered: the immediate cause of death was the extensive effusion.

Very recently, too, a case has been related of a female, aged 60, who, whilst in feeble health, struck her head with violence against a hard object, which gave rise to no symptom indicative of injury or disease of the brain, but finally sank fourteen days after the blow.

On dissection, the membranes of the brain appeared to be healthy, and the left hemisphere had its natural appearance; but on opening the right, several ounces of coagulated blood were discovered—the parietes of the cavity containing it being of the consistence of cream. In this case, the intellectual and moral faculties remained sound, and there was no loss of sensation or volition; yet the brain was extensively disorganized. (*Fowler.*)

The degree to which the paralysis is present varies; at times, it is complete from the first; at others, it may consist in a simple

heaviness of the limbs, or inability to grasp objects; but these symptoms go on augmenting, until complete hemiplegia is induced. They may, also, be the forerunners of the hemorrhagic effusion.

It rarely happens, that all the limbs of the body are paralyzed, but we can understand, that such may be the case, whenever the hemorrhage has occurred in both hemispheres, or if the hemorrhage of one side has been so considerable as to compress the other. In the latter case, if the patient survives, the clot may be diminished by absorption, so that the compression may be removed, and then one-half the body, corresponding with the hemisphere originally affected, will remain hemiplegic.

It has been long a matter of notoriety, that hemorrhage in one hemisphere of the brain produces paralysis of the opposite side of the body,—generally of both limbs; but, at times, of one only: the face, too, participates; and, as the muscles are paralyzed, the angle of the mouth is drawn upwards by the sound muscles of the opposite side.

The cause of this general law of decussation has been anxiously sought for by the anatomist, and it is admitted, that at the portion of the medulla spinalis at which the medulla oblongata unites with the medulla spinalis proper, there is a crossing of the anterior pyramids, or of those connected with motion, by which the fact, it has been conceived, might be explained. It is obvious, however, that this arrangement would not well account for the face of the hemiplegic side being paralyzed also on that side. Its movements and sensations are under the presidency of the seventh pair and fifth pair of nerves, which arise from the mesocephalon above where the decussation is presumed to take place; and although we may admit, that such a decussation of the anterior pyramids exists, it is probable, that a similar arrangement may exist in other parts of the mesocephalon, or even of the brain and cerebellum themselves. As regards the cross effect of sensation, Sir Charles Bell, in the year 1835, described before the Royal Society, a decussation connected with the posterior columns, or columns of sensation, but the accuracy of these dissections was doubted by eminent anatomists. (*H. Mayo.*) Since then, an arrangement of the spinal columns has been described, (*Hilton,*) which explains what before appeared unsatisfactory, and anomalous in pathology,—for example, the facts,—that the symptoms of encephalic lesion do not always take place on the opposite side of the body, but that they occur, at times, on the same side; that the loss of power and of sensation, although confined to one side, may exist in either the upper or lower extremity, but that both are not necessarily implicated; and that cases happen, which are altogether anomalous. Such cases having occurred to Mr. Hilton, and being totally incomprehensible to him, he carefully examined the continuation upwards, of the anterior and posterior columns of the spinal marrow into the medulla oblongata, and found, that the decussation at the upper part of the spinal marrow belonged, in part, to the column for

motion, and in part to the column for sensation; and farther, that the decussation is only partial with regard to either of those columns.

But, although rare—extremely rare—cases have occurred in which the paralysis has been observed on the same side as the encephalic lesion, the general law holds good, that in such cases there is a cross effect. An abstract of 16 cases has been given, (*Andral*), in which the hemorrhage was on the same side as the paralysis. None of these, however, were observed by M. Andral, nor has he witnessed any. No such case has fallen under the author's observation.

Attempts have been made to predict the seat of the encephalic hemorrhage, when the paralysis has affected one limb only; and numerous researches in this direction have been made by some of the most distinguished of living French pathologists.

When the lower extremity is paralyzed, the corpus striatum has been presumed to be the seat of the hemorrhage; when the upper, the thalamus nervi optici; but the number of observations cannot be regarded sufficient to establish the position, and it can only be determined by repeated dissections.

It is probable, however, that the portion of the cerebral lobes, which form part of the base of the brain, and are prolongations of the anterior column or column of motion of the spinal marrow, may be concerned; and, accordingly, the attention of pathologists has been greatly directed to those parts, to account for different lesions of motion. It would not seem, that paralysis results from hemorrhage into the convolutions of the brain; although such cases are on record. (*Andral*.)

When the hemorrhage occurs in the mesocephalon, it might be presumed, that all the limbs would be attacked with paralysis. Generally, indeed, the patient lies in a completely comatose state; but cases have presented themselves, in which hemiplegia alone was the consequence, probably owing to the effusion having taken place into one side only of the mesocephalon.¹

Hemorrhage into the cerebellum has given rise to questions equally interesting. It has been generally supposed, that the resulting paralysis should be on the same side as the hemorrhage,—seeing that the corpora restiformia, which concur in the formation of the cerebellum, do not decussate like the anterior pyramids. The facts, however, are, that the paralysis in cerebellous hemorrhage occurs in the opposite side of the body, as in cerebral hemorrhage, but rare cases have occurred in which the paralysis was on the same side. Some recent anatomical observations, (*Solly*), are calculated to throw light on this subject. These would seem to show, that there is a direct communication between the motor tract of the spinal marrow and the cerebellum. The corpora pyramidalia have been generally supposed to be formed by the entire mass of the anterior or motor columns of the spinal cord, but Mr. Solly shows, that not more than one-half of the anterior columns enters into the composition of these bodies; and that another por-

tion, which he terms the "antero-lateral column," when traced on each side in its progress upwards, is found to cross the cord below the corpora olivaria, forming, after mutual decussation, the surface of the corpora restiformia, and, ultimately, being continuous with the cerebellum.

Paralysis may also be induced by hemorrhage into the spinal marrow, and the upper or lower extremities or both are affected according to the seat of the effusion: where hemorrhage has occurred in one of the anterior cords, hemiplegia has been the consequence, and this has been on the same side as the lesion. The symptoms of *Spinal apoplexy*, or *Spinal hemorrhage*,—*Apoplexia myelitica seu medullaris*; Fr. *Apoplexie de la Moelle épinière*, *Hémato-myélie*, *Hémo-myélorrhagie*, (*Piorry*;) Ger. *Rückenmarkschlag*,—are however obscure. Abercrombie has detailed a case of convulsions in a child, thus induced, without paralysis, and he has cited similar cases from others.

Besides the limbs, other voluntary muscles are paralyzed in hemorrhage of the encephalon. Paralysis of the muscles of the eyelids, especially of the levator palpebræ superioris, is not uncommonly a forerunner of cerebral hemorrhage, and occasionally it presents itself for days before the attack; so that due warning is given. The inability of raising the upper eyelid is always, indeed, a most formidable premonitor of serious cerebral affections of this kind.

Of the paralysis of the muscles of the face, mention has already been made. It is on the same side as the loss of power over the limbs; the angle of the mouth of that side consequently drops, and when the individual smiles, the opposite angle alone is elevated.

In some cases, the movements of the tongue are not affected; in others, all command over the organ is lost, and the patient is unable either to protrude it or to articulate. In others, again, and most commonly, perhaps, its movements are implicated, and, when protruded, it is generally drawn towards the affected side: at times, however, although rarely,—it is carried towards the opposite side,—differences which are explicable by the paralysis affecting certain muscles rather than others.

Many endeavours have been made to discover the portion of the encephalon that presides over the speech, but the whole matter is enveloped in confusion. Bouillaud placed it in the anterior lobes of the brain; but, of 37 cases of cerebral hemorrhage seated there, the speech was lost in 21; preserved in 16; whilst in seven cases seated in the posterior lobes,—the anterior being wholly unaffected—speech was lost; and, in seven other cases, implicating the middle and posterior lobes only, the speech was equally lost. (*Andral*.) To prove the little that is positively known on this matter, it need only be remarked, that by one (*Récamier*), the encephalic seat of speech has been placed in the centrum ovale of Vieussens; by another, (*Serres*), in the corpus striatum; and, by another, (*Foville*), in the cornu ammonis. The fact appears to be, that the speech, like other mental manifestations, may be affected

by injury of any part of the encephalon; its loss has been seen to coincide with a state of apparent integrity in every part of the brain, and with lesions of the cerebellum and mesocephalon; and, although some particular portion of the brain may be morbidly affected in these cases, we are far from having attained any precise knowledge on the subject.

In very severe cases, the true spinal nerves are so obtunded, that the parts to which they are distributed lose all power; and difficulty of deglutition and relaxation of the sphincters supervene as in other formidable cerebral affections.

When paralysis has once occurred, in the extremities more especially, it may gradually improve, and yet never disappear. At other times, it retains nearly its first intensity. The nutrition of the affected limbs always suffers more or less, and, at times, becomes greatly impaired. When the paralysis disappears wholly, it is probably owing to the entire absorption of the clot, and the restoration of the continuity of nervous matter, so that the nervous action can be propagated through it.

It rarely happens, that the attack of hemorrhage is not preceded by some signs of intellectual disorder; the mental faculties are executed sluggishly; the patient is drowsy,—can scarcely, indeed, keep awake; or else great restlessness and unusual mental excitement are noticed: the first symptoms, however, more frequently exist than the others. Occasionally, different hallucinations occur, which are not prodromic of encephalic hemorrhage only, but of other serious lesions of the same organs.

In one case, the author was consulted by a gentleman, who had already experienced one attack of encephalic hemorrhage, and was threatened by another, who complained, that for months after he had been a visitor of the Military Academy, at West Point, he had been unable to get rid of the sight of the black board, with the demonstrations upon it, which had been used at the examination of the cadets. In other cases, equal hallucinations occur in the organ of hearing; sounds being heard, as of voices calling to the individual, which have no existence except in his imagination. After these hallucinations have existed for some time, unless timely warning has been taken, and often even in spite of every precaution, the patient is attacked with all the symptoms of encephalic hemorrhage.

In unusual cases, the mental faculties,—at times, even from the first, and, if not, after a short interval,—are executed as well as ever; but generally they suffer more or less, the individual being occasionally rendered utterly imbecile. The degree to which the mental faculties suffer, has been supposed to be somewhat dependent upon the extent of encephalic effusion, but dissection does not altogether confirm this; nor does it appear to be owing to the effusion having occurred in one part of the encephalon rather than in another;—great impairment of the mental and moral manifestations having been witnessed, not only when the hemorrhage has

been seated in the cerebral hemispheres, but in the cerebellum and mesocephalon. Commonly, however, whenever it implicates the latter body, the coma is profound, and the manifestations in question, therefore, abolished. (*Andral*.)

Even when the hemorrhage has occurred in the spinal marrow, the intellectual faculties have been found interfered with, and a case is related, (*Fabre*,) in which the anterior pyramids alone were the seat of a circumscribed hemorrhage, and yet there was a total loss of intelligence, and every symptom was as marked as in the most extensive effusions into the cerebral hemispheres. These facts prove how much we have to learn as to the encephalic seat of the intellectual organs, and how intimately they are associated with each other. The singular facts, indeed, upon record, in which large portions of the cerebral hemispheres have been lost or injured, without the mental manifestations suffering materially, if at all, would seem to show, that the seat of the mind is nearer the base of the brain than has been generally imagined.

In other cases, the memory alone is concerned, and it is more or less impaired,—sometimes generally, at others in certain points only. The memory of recent events is entirely lost in one; of noun-substantives in another, and of adjectives in a third;—facts of deep interest to the phrenological inquirer, but which are far from having been adequately elucidated by his researches. The cases of paralysis from cerebral hemorrhage afford, indeed, an excellent field for the numerical method applied to phrenology; the indications can be accurately marked before death;—the coincidence or non-coincidence of disease of a certain portion of the cerebral convolutions with the mental impairment can be traced with facility; and a number of such cases, accurately observed, without bias from preconceived notions, would do more to establish the doctrine if true, or overthrow it if false, than all the angry declamations that have been employed, and still are employed, on both sides of the question. This has not been done, and the mind of the cautious investigator must, therefore, still remain in abeyance.

Similar remarks are applicable to the effect upon the genital organs occasionally observed in *cerebellous hemorrhage* or *apoplexy* as well as in other affections of the cerebellum. Erection of the penis has occasionally been noticed, and this condition has at times continued after death. (*Andral*.) It is well known, that Gall places in the cerebellum the seat of the instinct of reproduction; and he, consequently, and his followers, ascribe the effect upon the genital organs to the cerebellous lesion. Cases, in which the coincidence has occurred, have been published, (*Serres*,) and one was given by the author in the pages of a British medical journal. On the other hand, in unquestioned examples of cerebellous apoplexy, no excitement of the genital organs has been perceptible. Four cases of cerebellous disease carefully observed have been detailed, (*Duplay*,) in which no particular phenomena were observed connected with the genital organs. “In no case did M.

Duplay notice anything like what had been announced by certain observers." It would, indeed, be strange, if serious injury of the cerebellum or of any organ were to produce increased energy of its normal functions; and, moreover, it has been found, that by passing a stylet into the spinal sheath, and by touching and irritating certain parts at a great distance from the cerebellum, erection and even ejaculation were produced. (*Ségalas, Andral.*)

Hitherto we have mainly considered the effect upon the animal functions, the organs of which are chiefly implicated: still, those of organic life are always more or less affected. The circulation may, indeed, appear to be normal; but commonly it is rendered slower, and the pulse fuller than natural, except when the hemorrhage has persisted for some time, when the circulatory powers are, at times, greatly enfeebled, especially in the paralyzed side. Soon after the occurrence of the hemorrhage, the face may be highly injected, and the surface warm; but, at other times, under the shock, the face is pale, and the surface cool; the breathing is usually slow and stertorous, and in cases of the *apoplexie foudroyante*, as it is termed by the French, the patient dies—as it were—in a state of asphyxia.

A recent writer, (*J. D. Fisher*, of Boston,)—who has described an encephalic or cephalic bellows' sound, heard on applying the ear to the occiput or to the top of the head, and which he considers to indicate turgescence of the vessels of the encephalon or inflammation compressing the vessels at the base of the brain—affirms, that he has noticed a modification of the normal cephalic sound of the heart in cases of cerebral hemorrhage. In each of six cases, the sound of the heart, as heard at the surface of the cranium, was decidedly abnormal. Instead of its being soft, and appearing as if it proceeded from a distance, as in healthy adults, it seemed to be near the ear, and was characterized by a kind of impulse, as if the whole brain was suddenly raised up against the calvarium. Dr. Fisher asserts, that he has heard it in every case of cerebral apoplexy in which he has practised cerebral auscultation; and he is strongly inclined to believe, that it is a constant symptom of the disease. He considers it to be caused by the brain, owing to the effusion of blood, being pressed down on the arteries on which it rests, and likewise against every point of its bony case, so that it cannot, for want of room, rise and fall with the pulsations of the arteries at its base, as it does in its natural condition: "and this being the case, the mass of blood thrown from the heart at each contraction of its left ventricle would strike with great force against the compressed parts of the arteries, and communicate a shock to the brain, which would be transmitted to, and be heard as an impulsive sound at the surface of the cranium." (*Fisher.*)

Lastly, some singular phenomena have been observed in these encephalic lesions, the explanation of which has been attempted (*Magendie*) in accordance with views before referred to, and which have been detailed at greater length in another work.

(*Human Physiology*, 4th edit. vol. i. 346: Philada. 1841.) One of these is an irresistible impulsion forwards, so that the individual would cast himself into the fire were it before him—indicating that the corpora striata, the seat of the backward impulse, (*Magendie*,)—are injured, and that the body is therefore given up to the forward impulse seated in the cerebellum. Two such cases occurred to an eminent observer, (*Andral*.) Another is a similar disposition to recoil, which Magendie explains by the presumption, that the cerebellum is injured, and the body is consequently given up to the backward impulse seated in the corpora striata. Such a case was related to the Académie Royale de Médecine by Dr. Laurent, of Versailles. Still, serious injury occurs to the corpora striata and to the cerebellum without any of these phenomena being observable.

Again, the case of an apoplectic is given, (*Serres*,) who presented, amongst other symptoms, the singular phenomenon of turning round; and, on dissection, an apoplectic effusion was found in one of the peduncles of the cerebellum, in which Magendie places the lateral impulse, and by whom similar phenomena were found to be produced on animals when one of the peduncles was divided.

These are singular results, and not less inexplicable than singular.

The ultimate result of cerebral hemorrhage is generally fatal; after one attack, the individual is predisposed to a second, which almost always supervenes sooner or later. In rare cases, however, the patient entirely recovers from a first attack, and ultimately dies of some other disease.

Causes.—These are the same as in hyperæmia or congestion of the encephalon, and, therefore, do not require enumeration. It would seem, from the registers of Paris, that of 177 cases, 60 occurred in winter; 42 in spring; 40 in autumn; and 35 in summer; and of 10,432 deaths from apoplexy at Milan, 1176 occurred in January; 1030 in February; 956 in March; 848 in April; 829 in May; 681 in June; 681 in July; 645 in August; 718 in September; 822 in October; 963 in November; and 1075 in December. (*Ferrario*.) It is proper, however, to remark, that hemorrhage of the nervous centres is very common in the torrid regions of the Globe, and of this the army physicians and surgeons are so well aware, that they caution such as are predisposed to this affection to avoid the scorching presidencies of British India. (See the author's *Elements of Hygiène*, p. 51: Philada. 1835) Some of the youngest hemiplegics the author has seen were attacked in that climate.

Age affords manifestly a predisposition. It has been seen occasionally in new-born infants. (*Valleix*.) After 40, owing to the varying evolution of organs, it is much more common. One observer, (*Falret*,) found the greatest number between 55 and 65 years of age; and of 69 cases, collected by Rochoux, the following was the proportion:—

In persons from	Cases.
20 to 30 years old, - - - - -	2
30 to 40, - - - - -	10
40 to 50, - - - - -	7
50 to 60, - - - - -	13
60 to 70, - - - - -	24
70 to 80, - - - - -	12
80 to 90, - - - - -	1
Total,	69

From estimates made at Milan, it would seem, that the tendency to apoplexy there increases with age in a geometrical progression, doubling every 10 years, to 80 years of age. (*Ferrario*.)

Sex is likewise a predisposition. The author already cited, (*Falret*), found, that of 2,297 cases, 1,670 were males, and 627 females. Of 11,731 cases of apoplexy in Milan, 6,492 were of males, and 5,239 of females. (*Ferrario*.) This may be accounted for, by the former being more addicted to modes of living and other circumstances, that may favour the occurrence of hyperæmia of the encephalon.

There is reason, likewise, to believe, that a particular conformation, derived from progenitors, exerts a powerful influence; yet the numerical method has not been rigorously applied to the determination of this point. Numerous instances are on record, which show that it has occurred as a family disease. The cases of two brothers are mentioned, (*P. Frank, Andral*), who died of encephalic hemorrhage, and whose children—eight in number—subsequently died of the same malady; and in the Collection of the Theses of the Ecole de Médecine in 1830, there is one in which it is stated that a pupil of the school lost his grandmother, mother, and sister by apoplexy; that one of his brothers had experienced an attack, but had not died; and that a very young sister had been affected with brain fever.

These and numerous other cases, which might be cited, show, that there is a predisposition evidently impressed at times on the organism, which may require but slight exciting causes to develop it.

Treatment.—This may be divided into that which is demanded during the existence of the premonitions, and that which is required when the hemorrhage has actually occurred. The former has been detailed under Hyperæmia of the nervous centres; the latter, consequently, will alone need consideration here.

One of the first therapeutical agents, that will suggest itself, is blood-letting. In all sudden and violent attacks, indeed, it is often had recourse to, before even the practitioner sees the patient, and frequently with unequivocally bad effects. Where hemorrhage, however, has occurred into the nervous centres, bleeding may be suggested to the therapist on good grounds:—in the *first* place, the hemorrhage, as we have seen, is often the result of hyperæmia,

which may not be removed by the small quantity that has been extravasated; and, consequently, there may be a risk of farther effusion. In the *second* place, the blood acts as an extraneous body on the encephalon, and may cause inflammation; and *thirdly*, it is desirable not only to prevent farther effusion, but to endeavour to cause the absorption of that which is already effused. With all those views, blood-letting has been commonly practised in apoplectic seizures. The object must be, to diminish the quantity of blood in the vessels, and it matters not whether it be obtained from the external jugular, the temporal artery, or the veins at the bend of the arm.

As to the quantity to be drawn, this must depend upon circumstances. No good, in any case, can be expected from excessive draughts. Although the symptoms may be those of polyæmia, immediately at the onset, it must be borne in mind, that they soon become those of diminished action. It has been properly remarked, (*M. Hall*,) that the measure of blood-letting may be very different in mere congestion, and in actual rupture. In the former, the patient exhibits extreme tolerance of loss of blood; in the latter, the system is extremely and even dangerously susceptible of the loss. Dr. Hall recommends, therefore, that the patient should be placed in an upright posture before the blood is allowed to flow; that his countenance and breathing should be watched; that the finger should be kept upon the pulse; and the moment the slightest indication of approaching syncope takes place, the flow of blood should be arrested, and the patient be placed in the recumbent posture.

There is no doubt, as a general rule, that if early syncope should supervene, the repetition of general blood-letting would be doubtful policy. Should the patient, on the other hand, bear it well, the operation may have to be repeated again and again; and when the therapist is doubtful as to whether he ought to carry the depletion from the general system much farther, he has, in cupping, a valuable agent, which operates partly as a depletive, and partly as a revellent. The cups may be applied to the nape of the neck, behind the ears, or to the temples; or leeches may be applied to the same parts, or around the anus.

It is all-important, however, to bear in mind, that the practice of drawing blood profusely, immediately on the occurrence of cerebral hemorrhage, cannot fail at times to be injurious. A shock is often given to the nervous system by the hemorrhage, resembling that which occurs in concussion of the brain, and if blood be taken away immediately, and from both arms, as is often done, the same injurious effects may result as from the same practice in concussion. The practitioner should not be led away by the clamour of bystanders; and if he be in doubt as to the propriety of blood-letting, he should wait until unequivocal symptoms occur to indicate its propriety or the contrary. (*H. Holland*: see, also, the author's *General Therapeutics*, p. 400: Philada. 1836.)

The head must be raised as in other hyperæmic affections of the

encephalon, and cold be applied to it; warm sinapised pediluvia being at the same time employed. Much value is to be expected from the use of revellents to the intestinal canal, either from the croton oil, as directed at page 226, or from ten or fifteen grains of calomel placed upon the tongue, if the individual be unable to swallow readily; or stimulating turpentine or other injections may be thrown into the rectum. Emetics have likewise been advised as derivatives, (*Jourdain*;) but, unless the stomach be loaded, the inconveniences likely to result from the increased impulsion of blood to the head, during the efforts of vomiting, may be productive of mischief.

Where the patient has gradually sunk into a state of coma, and the case has been esteemed almost hopeless, great advantage has arisen from mercurial inunction. (*Löwenhardt*.) An instance is given, in which blood-letting was performed; stimulant enemata were administered, and the usual remedies employed, for twenty-four hours without any improvement in the patient's condition, and in which the subsequent inunction of three ounces of mercurial ointment producing salivation was followed by amelioration of all the symptoms, and ultimate recovery. (*Löwenhardt*.)

Such are the chief means to be employed in the apoplectic seizure. When it has passed away, and we have the consequences—the paralysis especially—remaining, a different course is necessary. There may be still, for a time, more or less disposition to hyperæmia, which may be met by cupping on the nape of the neck when it manifests itself, or by other forms of counter-irritation. With this view, a seton is often inserted in the nape of the neck.

When the immediate consequences of the hemorrhage have been subdued, and the attention of the practitioner has to be directed to the resulting paralysis, it is important for him to bear in mind, that his confidence has to be greatly reposed in the recuperative powers of the system, and that time, therefore, is a necessary element in the treatment. It is customary to apply excitant agents to the paralyzed parts, but these are rarely productive of much benefit; various excitants, too, have been administered internally, but they obviously cannot exert any beneficial agency on the pathological condition of the encephalon, whilst they are apt to hurry on the organic actions; and, by exciting hyperæmia in the vessels of the encephalon, may give occasion to farther effusion. Of all the various liniments that have been employed, there is none better than the use of the flesh brush, yet its agency,—for the reasons assigned,—can be but limited, and whilst it or any other excitant is had recourse to, time is passing and the encephalic mischief is becoming diminished; for like reasons, electricity, applied in any form to the paralyzed limbs, has not been found to be possessed of much beneficial agency.

Of late years, acupuncture and electropuncture, (*J. Cloquet*, and others,) and ointments of the delphinia, veratria,¹ and the counter-irritant lotions of Granville,² have been used, and, at times, with apparent advantage; but the same remarks are applicable to

all these excitants, that have been made on those already mentioned.

¹ R.—Delphiniaë, seu
Veratriæ, gr. x.—xxx.
Adipis, ʒj. Misce intimè.

The size of a hazelnut to be rubbed in, morning and evening, for from 5 to 15 minutes.

² R.—Liq. ammon. fortiss. ʒj.
Sp. rorismarin. ʒvj.
— camphor. ʒij.—M.

A piece of flannel to be impregnated with the lotion, and applied to a small portion of the paralyzed surface, for a minute or two.

Internally, the flowers and root of the arnica are much employed in Germany; and especially the *oleum æthereum florum arnicæ*. Schneider recommends it in old cases of paralysis, that are the result of the apoplectic condition.

R.—Ol. æther. florum arnicæ, gtt. iv.
Sp. ætheris sulphuric. comp., seu
— ætheris nitrici ʒss.—M.

Dose, four to twelve drops, four times a day.

He often administered it with marked success,—the paralytic limbs becoming warmer, more active, and more serviceable under its use. (See the author's *New Remedies*, 4th edit. Philad. 1841.)

Brucia has also been given in paralysis with varying success; but it would seem to have acted most beneficially in paralysis resulting from lead poisoning.

R.—Bruciaë, gr. xij.
Conserv. rosar., seu
Micæ panis. ʒss.—Misce et divide in pilulas xxiv.
Dose, one pill, twice a day.

The alcoholic extract of nux vomica has in recent times been more frequently, perhaps, administered as an excitant to the nervous system, than any other agent of the kind. It has been highly extolled by numerous distinguished observers, (*Magendie, Fouquier*.) The author's experience with it has not been limited, but although he has succeeded in inducing tetanic movements in the affected limb, he has not been satisfied, that much advantage has been derived from it. (*Jahn*.)

R.—Extract. nucis vomicæ alcoholic. gr. xij.
— glycyrrhiz., seu
Conserv. rosar. gr. xxiv.—Misce intimè et divide in pilulas xij.

Dose, 1 or 2, increasing the dose gradually until tetanic effects are induced.

The same may be said of the active principle of the nux vomica—strychnia,¹—but, from the observations of different practitioners, it would seem, that its efficacy is greatest in paraplegia; less so in hemiplegia, although it appears to have been given with advantage in the latter affection; but its administration in hemiplegia requires special circumspection, particularly when the paralysis has succeeded to apoplexy, and where there is constant danger of the recurrence of the hyperæmia, which was probably its precursor. (*Pétriquin, Bally*.)

¹ R.—Strychniaë, gr. ij.
Conserv. rosar. gr. xxiv.—Misce et divide in pilulas xxiv.
Dose, one, night and morning, gradually increasing the number.

Or,

℞.—Strychniæ, gr. iij.

Alcohol, ℥j.—M.

Dose, six to twenty-four drops, twice or thrice a day.

In high grades of paraplegia, the internal use of the remedy is to be preferred; but, in general, the endermic administration is more satisfactory. In paralysis of the limbs, a spot is generally selected in the vicinity of the spinal marrow.

Lastly, a recent observer, (*M. Payan*,) thinks, that experiment has shown the *secale cornutum* to be primarily and essentially an excitant of the spinal marrow; and he conceives, that its agency on the uterus, bladder, and lower extremities is but secondary, from a reflex action transmitted from the spinal marrow to those organs through the nerves distributed to them. He has given the details of some cases of paraplegia, which seemed to be relieved by the ergot;—an infusion of fifteen grains in water being given at first in the course of the day, and the dose being gradually augmented.

Should the powers of the system seem to fail, they must be supported by a more liberal diet, and by the use of tonics, which are devoid of stimulating properties; perhaps there is no better than the cold infusion of the cinchona; or the infusions of gentian or colomba of the *Pharmacopœias*, given in the dose of an ounce and a half, three or four times a day. With a view of preventing a recurrence of the hemorrhage, great care should be enjoined in the use of appropriate diet, which should be moderately nutritious, but not excitant. The patient should take exercise in the open air as much as is practicable; should avoid tight clothing, especially about the neck, which might compress the vessels, and impede the return of blood from the head; and should keep the head cool and the feet warm. In bed, the head should be moderately raised, and the air of the chamber be cool and pure. Attention should, likewise, be paid to the alimentary canal, which is apt to be torpid in those affections, and to demand the frequent use of *lavemens*.

V. HYPERTROPHY, AND ATROPHY OF THE NERVOUS CENTRES.

SYNON. *Fr.* Hypertrophie et Atrophie des Centres Nerveux.

Hypertrophy of the brain—*Hyperencéphalotropie*, (*Piorry*,) —has not been long known, and it is by no means common. Its pathological characters are;—approximation of the convolutions, so that the anfractuositities are almost destroyed, and the brain exhibits a smooth surface; the ventricles, too, are effaced or nearly so, and the membranes of the nervous centres seem distended almost to bursting. (*Dance, Andral, Munchmeyer*.)

In the encephalon, it has only been seen in the cerebral hemispheres, and, in these cases, if the bones of the cranium are not formed on a larger outline, they press upon the brain, so as to disorder its functions; the patient becomes dull, almost idiotic, and suffers greatly from depravation of the senses of vision and audi-

tion, and from headache: epilepsy and convulsions have, also, been produced by it.

It is scarcely necessary to say, that we have no means of diagnosing this pathological condition; and, if we had, it would be difficult to suggest an adequate remedy. The symptoms have, consequently, to be met as they arise, and to be treated upon general principles.

Hypertrophy of the spinal marrow is not less obscure; but, fortunately, it is extremely unfrequent.

On the other hand, *Atrophy of the nervous centres* is met with at times. We see the cerebral substance become absorbed,—*Anencéphalotrophie*, (*Piorry*,)—in encephalic hemorrhage; and there are cases in which the atrophy is sufficient to induce helpless dementia. Such, at least, is the observation of one pathologist. (*M. Hall*.)

VI. SOFTENING OF THE NERVOUS CENTRES.

SYNON. *Fr.* Ramollissement des Centres Nerveux.

This pathological state has only been described in modern times; and although supposed by some to be the consequence of inflammation of the nervous substance, it would not appear to be always so. (*Rostan, Howship*.) Many pathologists describe it, from this supposed cause, under the head of *Cerebritis*, and some under that of *Encephalitis*. One observer, (*Cruveilhier*,) under similar views, denominates it *Capillary apoplexy*, (*Apoplexie capillaire*.) Another, (*Rostan*,) who saw it chiefly in the aged, considers it to be analogous to the gangrene of old people; whilst others (*Abercrombie, Robt. Law*) think, that it is analogous to gangrene in other parts of the body, and, like gangrene, may arise from two very different causes—inflammation, and failure of the circulation from disease of the arteries;—the latter, he conceives to be the source of the appearances described by *M. Rostan*.

To the softening of the brain, the terms *Malacosis cerebri*, *Encephalomalacia*; *Fr.* *Ramollissement du cerveau*, *Encéphalomalaxie*; (*Piorry*;) *Ger.* *Gehirnerweichung*, *Zerfliessung des Gehirns*, *Ataktische Entartung des Gehirns*—have been assigned.

Diagnosis.—The chief symptom, that characterizes softening of the nervous centres, is a fixed local pain, which does not yield to the ordinary therapeutical agents;—the pain being frequently unaccompanied by any excitement of the circulation. Where the cerebral hemispheres are softened, the intellect is more or less blunted; and sensation and motion are not accomplished as in health; generally, both are impaired; but, at times, sensation is augmented, whilst motion, perhaps, on the opposite side to the affected hemisphere, is impracticable. Paralysis is, indeed, a common attendant on softening, especially where the corpora striata and the parts in their vicinity are concerned. At other times, instead of the limbs being paralyzed, they are more or less rigid and contracted.

It has been affirmed, (*Rostan*,) that the corpora striata and thalami nervorum opticorum are the parts which are most frequently the seat of the softening. In cases, however, of the simple uncomplicated disease, some part of one or other of the hemispheres is most commonly affected; and of these, the right suffers more frequently than the left, in the ratio of two to one. (*Rostan, Fuchs*.)

Cases are on record—and the author has himself met with such—where the intellect was unaffected, although the softening was great. One of the most interesting examples of the kind was communicated to him. (*Boerstler*, of Lancaster, Ohio.) In this case, the place of the skull, previously occupied by the right anterior and middle lobes of the cerebrum, presented a perfect cavity, the hollow of which was filled with some sero-purulent matter, and the left hemisphere was in a state of *ramollissement* down to the corpus callosum. It was so much softened, that the slightest touch would remove portions; yet, in his daily visits to the subject of this case, Dr. Boerstler could not discover the slightest derangement of the intellectual faculties; no dulness of sensibility, no obtuseness of perception, no impairment of judgment, no want of memory. Such cases can, however, only be regarded as anomalies.

The following case, which fell under the author's charge, is a good example of *ramollissement* and its consequences, supervening evidently on inflammation.

A man, aged 21, after much exposure to the sun, was attacked with vomiting and intense pain in the head, on the 15th of July, 1839; for this his head was shaved, and cups, leeches and blisters were applied to the nape of the neck; blisters were also applied to the lower extremities, but he grew gradually worse, and, on the third day of August, was deprived of speech. Rigidity of the right arm and leg was also noticed, which continued to grow worse until the 9th, when the author saw him. He was then much emaciated; right side completely paralyzed; extremities very rigid; face distorted; mouth drawn to the left side; pupils dilated; respiration laboured; and he took no notice of anything. He went on slightly improving until the 23d instant, when, after an attack of faintness, he was found comatose, with complete loss of sensation, motion and intelligence, from which he could not be aroused, and died on the 25th of August.

On dissection, the meninges of the brain were found unusually injected, with evidences of previous inflammatory action; the substance of the corpus striatum of the left side, in its upper portion, to the extent of about one-fourth of an inch, was reduced to a greenish yellow pulpy mass; portions of it were in the state of a yellowish pus, and the medullary matter of the brain, on that side, as far up as the base of the convolutions, was softened to the extent of two and a half inches in the antero-posterior direction, and two inches in the transverse, extending more particularly to the anterior part of the

brain; about a gill of fluid was found between the membranes and the brain, immediately anterior to the medulla oblongata.

Where the softening is seated in the mesocephalon, or in the medulla spinalis, the intellect may be unimpaired, but the functions of sensation and motion are always—or almost always—more or less affected.

The following table, being an epitome of cases recently published, exhibits the results of the observation of one (*Prus*), who, from his situation as physician to the large establishment of La Salpêtrière, in Paris, has ample opportunities for investigating the diseases of the nervous centres.

Pathological appearances.

Functional phenomena.

1. Gelatiniform softening of the two inferior thirds of the spinal marrow.	{ Contraction of the extensors and flexors of both lower extremities; sensibility persisting, but modified; progressive paralysis of the sphincters of the rectum and bladder.
2. Superficial softening of the whole circumference of the medulla oblongata.	{ Sudden loss of speech; deviation of the mouth to the right side; progressive diminution in the voluntary power of the left arm; incomplete paralysis of the left side of the face, without any change in the sensibility; involuntary discharge of saliva; great dyspnœa.
3. Slight softening of the posterior columns of the spinal marrow in the portion constituting the lumbar swelling.	{ Pricking and loss of sensibility of all the limbs, especially of the lower, and incontinence of urine.
4. Softening of the spinal marrow in the cervical and lumbar portions; the gray matter of the cord invisible in the diseased parts, and almost so in others.	{ Progressive paralysis of motion only in all the limbs; paralysis of the sphincters of the rectum and bladder; spasmodic respiration.
5. Reddish softening in the middle lobe of the right hemisphere, and in the anterior lobe of the left hemisphere; spinal marrow perfectly healthy.	{ Paralysis of motion only in all the limbs, which are slightly contracted; progressive paralysis of the sphincters of the rectum and bladder.

Treatment.—As there appears to be no mode by which ramollissement of the nervous centres can be accurately diagnosticated, the affection has to be treated upon general principles.

VII. INDURATION OF THE NERVOUS CENTRES.

SYNON. *Fr.* Induration des Centres Nerveux.

This condition may likewise be the consequence of inflammation of the nervous centres. When it is present, the symptoms, although by no means pathognomonic, resemble those induced by accidental productions; and, accordingly, epilepsy is a by no means common evidence of it. Induration is, however, far less common than softening. The intellect may be affected or not by it, when it is seated in the cerebrum or cerebellum, or paralysis may be the consequence; and this gradually increasing has been regarded as indicative of induration of the spinal marrow.

Treatment.—As induration of the great nervous centres may be

present along with hyperæmia, as well as anæmia of the brain, and may be accompanied or not by evidences of concomitant inflammation, it is impossible to lay down any general method of management. Like softening of the same parts, it will have to be met on general principles; and, after all, dissection may alone establish that it has been present.

VIII. ACCUMULATION OF SEROUS FLUID IN THE NERVOUS CENTRES.

The nervous centres—being enveloped by a serous membrane, which passes into the cavities, and, like other serous membranes, is the seat of a watery secretion—are liable to œdema, or to dropsy from the accumulation of such secretion. This accumulation may be owing to simple loss of balance between those vessels whose office it is to take up, and those which deposit the secretion; and the problem, with the pathological inquirer—as in other similar cases—is to decide upon the precise condition that breaks in upon this balance.

Effusion is known to be one of the terminations of inflammation, and hence we have hydrocephalus as one of the consequences of encephalitis; properly, indeed,—as has been shown,—the hydrocephalus acutus of writers is but a form of encephalitis. At other times, effusion takes place owing to hyperæmia of the vessels, no matter how produced,—transudation occurring through the coats of the over-distended vessels; and this is probably the mode in which *Serous Apoplexy*—*Apoplexia serosa*, *A. pituitosa*; Fr. *Apoplexie séreuse*, *Hydro-encéphalorrhée*, (*Piorry*;) Ger. *Seröser Schlagfluss*,—occurs, all the signs of hemorrhage presenting themselves, and the patient sinking, whilst dissection exhibits only an unusual amount of serum in the ventricles. It can be readily understood, too, that this condition may be coexistent with softening of the brain, as hemorrhage is known to be; and that hemorrhage and effusion of serous fluid may also be present together.

Occasionally, it would seem, that an infiltration of serous fluid takes place into the cerebral pulp, so that it appears more moistened or watery than common; and, when sliced or pressed, small drops of water are seen to ooze out. This œdema—*Œdema cerebri*; Fr. *Œdème du cerveau*—may exist along with accumulation of fluid in the arachnoid, in the ventricles, or at the base of the brain. The acute form of this affection—as might be conceived—is characterized by symptoms like those of cerebral hemorrhage, owing to pressure:—the chronic stage is said to have been met with more especially in persons of advanced age, in whom sensation, motion and intelligence have given way, without our being able to refer the impairment to the influence of age. The stupidity of the insane has likewise been attributed to chronic œdema of the brain. (*Dubois*, d'Amiens.)

It would appear, that during life, and in health, the ventricles of the brain contain a quantity of serous fluid; that this quantity decreases in proportion to the interval between death and the exami-

nation of the body; and that this fluid disappears owing to the hygrometric properties of the brain, and is found in the cerebral substance. Experiment, indeed, shows, that the brain is markedly hygrometric: if a piece of the cerebral substance of a dog just killed be plunged into water or serum, it will absorb its own weight of those fluids. (*Magendie, Guillot.*) These facts render it important to take into consideration—in our examinations of the brain—not only the quantity of the fluid found in the ventricles, in the cavity of the arachnoid, &c., but likewise that contained in the substance of the brain itself.

When the cephalo-spinal fluid, which naturally exists in the spinal sheath, accumulates in the spine, we have the affection commonly known under the name *Hydrorachis*. The ordinary quantity of the fluid in health has been estimated at two ounces, (*Magendie,*) and if this be augmented from any cause, serious inconvenience may arise from the compression; yet a certain degree of compression by it is necessary, in order that the medulla shall execute its functions normally, and if the pressure be suddenly withdrawn, inconvenience—as fatal syncope—it has been imagined, might be the result.

Generally, in infants, in whom the fluid in the spinal sheath accumulates, the spinous processes are cleft, or there is *spina bifida*, so that the membranes protrude, and the compression is diminished.

We have remarked, that acute hypercrinia of the encephalon is often the consequence of inflammation, or of hyperæmia; the symptoms, consequently, are so imprecise, that we cannot pronounce positively as to the cause of the compression, but the accumulations of fluid, which occur in a more chronic manner, generally exhibit their existence by unequivocal symptoms in the bony coverings,—the serous fluid, if contained within the cranium, distending the bony parietes, preventing the obliteration of the fontanelles, and causing the head to acquire, at times, enormous dimensions, so as to constitute *Hydrocephalus chronicus*, *Hydrops capitis*; Fr. *Hydrocéphale*, *Hydro-céphalo-ectasie*, (*Piorry*;) Ger. *Wasserkopf*, *Kopfwassersucht*.

When the cerebral development is examined in these cases, it presents singular appearances. According to some, (*Gall, Spurzheim,*) all the parts exist, but they are simply deployed by the fluid. At times, however, the brain has been found in an entirely rudimentary state, and exhibiting the inaccuracy of a fundamental proposition of those writers;—that where there are no nervous centres, there can be no cranial development. It has been proved, that in many cases, water alone may be found in bony cavities that are regularly formed.

Treatment.—The treatment of the acute forms of serous infiltration into the nervous centres must be the same as that recommended in encephalitis, which has terminated in signs of compression.

Where children, or young individuals, are attacked with coma, without any vascular excitement,—the skin, on the contrary, being cool, and the surface pale—serous effusion may be suspected, directly or indirectly induced by nervous exhaustion or inaction; in such case, general blood-letting cannot be indicated; revellents have to be trusted to, and the whole of the treatment advised at page 247.

In cases of chronic accumulation of fluid in the nervous centres, the object is, if practicable, to remove the fluid, and prevent its re-accumulation. Compression—methodical compression—has been applied to endeavour to promote the absorption of the fluid, and occasionally with success, (*Bricheteau*;) at others, both in hydrocephalus chronicus (*T. J. Conquest*) and in hydrorachis, the fluid has been cautiously evacuated, and cases are on record in which the sudden evacuation of the fluid in the latter disease has not been productive of as much deleterious influence on the function of innervation as had been supposed. (*Spencer*, of Philadelphia.)

The operation, practised by Dr. Conquest, consists in passing a small and delicately constructed trocar into one of the lateral ventricles, and drawing off as much fluid as the powers of the constitution will admit of. The most eligible spot, at which the trocar can be introduced, he considers, is in the course of the coronal suture, about midway between the crista galli of the ethmoid bone and the anterior fontanel, and so that the danger of wounding the corpus striatum is avoided on the one hand, and the longitudinal sinus on the other. The instrument usually penetrates about two inches, and, in most cases, the serum is colourless, but occasionally tinged with blood. At times, on withdrawing the trocar, the water will not flow until a probe has been passed through the canula, to remove portions of the cerebrum that block it up.

After the fluid is withdrawn, methodical compression may be employed over the whole head in cases of hydrocephalus; and by means of compresses, cautiously used, in hydrorachis or spina bifida.

IX. PUS IN THE NERVOUS CENTRES.

The secretion of pus into the nervous centres is a consequence of inflammation. It is met with at times diffused in the nervous substance, and at others encysted, forming an abscess.

Encephalitis ending in the secretion of pus is sometimes induced by the irritation of caries of the petrosal bone extending to the meninges or substance of the encephalon, giving rise to the affection called *cerebral otorrhœa*,—or otorrhœa complicated with, and causing, inflammation and suppuration in the meninges and the brain. Suppuration of the brain is not an unfrequent consequence of wounds, and reference has already been made to such cases, in which the brain exhibited a broken down and purulent condition. As in other internal organs, too, metastatic suppuration may be induced in the encephalon.

The symptoms of suppuration of the nervous centres must necessarily be equivocal. The indications of previous inflammation may exist, and the individual may die, without any decisive evidence that the inflammation had terminated in suppuration. The fact may only be revealed by dissection. In certain cases, indeed, the individual has retained all his intellectual powers until the last, when extensive suppuration has been found in the cerebrum; and the same has been remarked when the abscess has been seated in the cerebellum. In other cases, headache in the occipital region, or paroxysms of cephalalgia, have been the only or the main symptoms.

X. MORBID FORMATIONS IN THE NERVOUS CENTRES.

a. *Cellular, adipous, fibrous, cartilaginous, and osseous formations in the nervous centres.*

In the tissues of various parts of the economy, transformations may occur into *analogous tissues*, or such as exist elsewhere; or into *heterologous* or *heteroclite tissues*, or such as have nothing similar to them in the healthy economy. In both cases, the nutritive vessels have their action changed, and depraved, but in the latter, the deviation and depravation are more complete.

The mode in which cellular transformations occur in the nervous centres is generally the following: owing to an effusion of blood or pus into some part of the nervous substance, a cellular or serous membrane is formed, from which a serous fluid is secreted, that softens the effused substance and facilitates its absorption: when this is taken up, the sides of the membrane may come together, and a cicatrix be thus established; or, if any rupture or laceration occurs in the nervous substance, the tissue becomes softened, and, in order that union may take place, it passes to a less advanced state of organization or to the state of cellular tissue, and this may become the nucleus for adipous, fibrous, cartilaginous, or osseous productions.

At other times, however, osseous deposits are found, which do not admit of this explanation, and which afford no clue to the cause of the transformation. In the case of a young female, who died at the Hôpital des Enfants, half a dozen small, irregularly shaped concretions, like splinters, were found occupying the centre of one of the lateral lobes of the brain. (*Andral, Blandin.*) No particular symptom indicated their existence during life.

As there are no symptoms that demonstrate the presence of these transformations, except what equally announce the presence of other tumours in the nervous centres, nothing need be said of the treatment adapted for them.

b. *Tubercular, scirrhus, and encephaloid transformations.*

1. *Tubercles.*

These are met with more frequently in children than in adults; and they occur both in the cortical and the medullary substance;

they may affect, too, the meninges of the brain as they do other serous membranes, and, in such case, may compress the nervous substance. Their size varies from that of a millet seed to that of a pea or an egg, and they are, at times—some say always—enveloped in a cyst, (*Leveillé*), especially when they proceed to softening. Cases have occurred, in which a whole lobe of the brain has been transformed into a tubercular mass; at times, too, but one tubercle has been found; and, on the other hand, a case is on record, in which there were two hundred in the gray substance. (*Andral*.)

The presence of tubercles is, at times, productive of no change in the surrounding nervous substance; but, at others, inflammation and its consequences are excited. When seated in, or near, the meninges, these have been found injected, thickened, and adherent either to each other or to the nervous substance; and, at other times, copious effusion of a serous fluid is met with. Hydrocephalus acutus—as elsewhere remarked—has been presumed to arise from the presence of tubercles, and when children have died of tubercular disease, these formations have been found in the brain, and their presence has been indicated by symptoms of meningitis, in this case, *tubercular meningitis*.

As to the causes of these tubercles, which are most frequently seen in children from one to five, and from ten to twelve years of age;—they are evidently dependent upon a perversion of the function of nutrition of a peculiar nature. There must, indeed, be here, as in all cases, a peculiar diathesis, which is often derived from progenitors, but is, doubtless, frequently acquired.

The symptoms of tubercles in the nervous centres are not decisive. They are such as are induced by chronic inflammation and its results: as, however, the coincidence of tubercles of the lungs with tubercles elsewhere is so general, almost universal, if a child complains of headache singly or combined with disorder in the movements, and if, on examining the chest, there are physical signs of tuberculosis, the evidence will be very strong, that the same condition exists in the encephalon.

It is a curious fact, however, that tubercles of the brain would appear to exist frequently without occasioning any disturbance of the cerebral functions, and only be discovered after death. They may even attain a very considerable size, without giving rise to irritation or inflammation of the surrounding neurine. (*P. Hennis Greene*.)

In almost all cases of encephalic tubercles, the progress of the disease is slow, with occasional acute attacks as of delirium or convulsions: but, sooner or later, signs of encephalitis occur under which the patient sinks.

Tubercles in the spinal marrow may be indicated by impairment of sensation and motion, but it need scarcely be said, such impairment is not pathognomonic.

2. Scirrhus and encephaloid productions.

These formations are by no means so common as tubercles, nor

can their existence be more than suspected during life. Their size of course varies; at times, they are not larger than a nut; whilst, at others, they occupy a considerable space in the encephalon.

The symptoms, produced by them, are equivocal, and cannot be diagnosticated from those caused by tubercles or chronic affections of the encephalon in general. As in the case of other tumours,—being slowly formed, they may exist without giving rise to any symptoms; or they may occasion paralysis, or convulsions, or inflammation of the brain or its membranes.

From an examination of the recorded cases of numerous observers, (*Abercrombie, Andral, Lallemand, Nasse, Jacobi, Rhodius, Kramer, Burdach,*) a recent writer, (*Albers,*) has deduced the frequency of tumours in different parts of the brain to be as follows:—

In the circumference of the brain, - - - - -	52
In the gray substance of the hemispheres, - - - - -	53
In the medullary substance of do. - - - - -	34
In the corpus striatum, - - - - -	2
In the thalami nervorum opticorum, - - - - -	9
In the corpora quadrigemina, - - - - -	1
In the right lateral ventricle, - - - - -	12
In the left do. - - - - -	3
In the gray substance of the cerebellum, - - - - -	22
In the medullary substance of do. - - - - -	22
In the corpus callosum, - - - - -	2
In the medulla oblongata, - - - - -	4
In the pons varolii, - - - - -	11
In the tuber annulare, - - - - -	10

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It would appear, consequently, that the greater hemispheres, the circumference of the brain, and, after these, the cerebellum, are the most common situations for tumours.

3. *Calculi.*

Calculous concretions have been found in the nervous centres; the greater part in the hemispheres of the brain, but in one case in the cerebellum. The symptoms, induced by them, have been so various as not to be adequate to any satisfactory diagnosis.

XI. ENTOMOZOA IN THE NERVOUS CENTRES.

It has been before remarked, that cysts are met with in the nervous centres, which, at times, contain a considerable quantity of fluid, as much as sixteen ounces. (*Abercrombie.*) According to some, these, as well as most tumours developed in different parts of the body, are of hydatid origin. True hydatids have, however, been found in the brain. A case has been published of this kind, in which the hydatid was lodged in a cyst. It resembled a small vessel full of liquid, terminated by a kind of cylindrical neck, was alive, and capable of elongating and contracting itself. Two other free *cysticerci* escaped from a neighbouring portion of the cerebral substance.

These are the only entozoa that have been met with in the nervous centres of man.

The same remarks as to symptoms and treatment that were made on other morbid productions apply equally here. It is impossible to foretell their existence during life, and therefore no special medication can be adapted to them.

The following cases sufficiently exhibit the obscurity that must rest upon them, until the precise nature of the affection is revealed by dissection.

Two cases of the kind have recently been reported as occurring in the practice of M. Martin-Solon. (*Michéa*.) The symptoms, in the first case, in a man 53 years of age, resembled those of effusion of blood into the right hemisphere of the brain followed by hemiplegia. The dura mater was very vascular, with slight serous effusion into the cavity of the arachnoid, and injection of the pia mater. Opaline vesicles were found in both hemispheres, but mostly in the anterior lobe of the left, of the size of large peas, and containing a transparent fluid, the centre of which was occupied by a small, globular, opaque, milky-white body, without head or tail, visible by the microscope.

The second case was in an epileptic patient, aged 23, in whom the acephalocysts were found in smaller numbers.

The following case of chronic meningitis, complicated with softening of the brain and hydatids, fell under the author's care, and was reported by one of the then resident physicians to the Philadelphia Hospital. (*Vedder*, of Schenectady.)

A married woman, aged 47, was admitted into the lunatic asylum, on the 18th of September, 1839. No anterior history could be obtained. The expression of her countenance was unfixed; face not flushed; pupil of the left eye much smaller than that of the right. She talked very little, and in a low tone; and there was manifest delirium; but no vascular excitement. She remained nearly in this condition, until the 27th; the pulse, however, becoming smaller and more frequent—96. The only evidence of encephalic lesion was the want of correspondence between the pupils, the unfixed expression, and the mental aberration; there was no constipation, and no vomiting. She seldom slept more than six hours, and usually only two or three. At one time, she imagined that people were calling her; at another, that serpents were in her bed, on which account she positively refused to sleep in it, preferring to lie under it, which she not unfrequently did.

The treatment, until the 27th, consisted of moderate purging, revulsion to the nape of the neck, and hypnotics. The case, at this time, would, doubtless, have been pronounced one of insanity, but for the appearance of the pupils: at one time, indeed, it was imagined that this might be accidental.

Her condition on the 29th was as follows:—expression rather dull, pupils more contracted and unequal; head cool; no delusion; appetite slight; pulse 86, small and quick. At the visit, she was

found lying under the bed: insists, that her husband is dead; has slept none for the last two nights, although the hypnotic was given as usual. (A blister was applied to the nape of the neck.)

No important change took place, until the 10th of October. It may be worthy of notice, however, that she imagined herself made of glass, and was in the greatest dread of being touched, crying out—when she was approached,—“You will break me!”

On the night of the 10th of October, she became more delirious and noisy: saw murderers armed with knives. On the 8th, she complained of pain in the abdomen, which was the first time she had experienced pain since her admission into the hospital. Sleeps less; illusions of seeing and hearing; answers correctly; lies on the back with the lower extremities drawn up; eyes dull; pupils equal and dilated; knits her brows; tongue red and shining; pulse 102, small; skin harsh and dry; speech thick; hearing acute; rigidity of both arms equal; whole body very rigid.

The blister was dressed with the unguentum hydrargyri, and the following powder was ordered:—

R.—Hydrarg. chlorid. mit. gr. ij.
Morphiæ sulphat. gr. $\frac{1}{8}$.—M.
To be given every third hour.

R.—Fol. sennæ,
Magnes. sulphat. āā $\mathfrak{z}$ j.
Infunde in aquæ bullient. Oj.
To be administered as an enema.

On the 12th, the cerebral expression was more marked; pupils contracted; muttering delirium; speech more thick and unintelligible. The rigidity had increased; no distortion; no evacuation for the three days preceding; retention of urine, which had to be drawn off by the catheter.

The powders were continued every hour; and the following pills were administered:—

R.—Ol. tigllii, gtt. ij.
Micæ panis, q. s. ut fiant pil ij.

A blister was also applied behind the ear.

No effect was produced by the croton oil; and the vitality of the system was too much reduced to be affected by the blister; the pupils were contracted to a point, and there was a slight distortion of the mouth.

On the 14th, there was an evident mercurial fœtor of the breath; the tongue was thickly coated, and the mouth covered with sordes. There appeared to be, at the same time, an improvement in all the symptoms; the intelligence was not lost; she endeavoured to say something, but was unable to articulate. She died on the 16th of October.

On examining the body, eighteen hours after death, the membranes of the brain were found to be slightly adherent, and opaque, at the summit, but the substance of the encephalon was of good consistence. The anterior half of the base of the cerebellum was

highly injected, and the membranes were opaque. The substance of the cerebellum in the central portion was firm. Very little fluid was found in the lateral ventricles. At the anterior margin of each lobe of the cerebellum, there was a deposit of hydatids in the membranes, which was most marked on the left side; beneath this deposit, the cortical substance was softened, as well as the medullary, to the depth of half an inch. No other part was examined.

The case was interesting on account of the mildness of its manifestations, and the length of time it took in running its course. Such cases are unquestionably often taken for insanity.

CHAPTER II.

OF THE NEUROSES.

SYNON. *Fr.* Névroses.

THE diseases of the nervous system, which have been thus far considered, are accompanied generally by lesions appreciable on dissection, and on which they are dependent. We have still to consider several most important affections, which are seated in the nervous centres, and which are, at times, accompanied—not perhaps induced—by pathological appearances of different kinds, some of which have doubtless been induced in their progress. It is to diseases supposed to have their seat in the nervous system, and which are indicated by disordered sensation, volition, or mental manifestation, without any apparent lesion in the structure of the parts, that the term *Neuroses* has been generally appropriated. There can be no question whatever, that all of them are accompanied by organic modification, otherwise it would be impossible to comprehend the singular aberrations of function, but still such modifications are not clearly revealed on dissection.

The neuroses may be characterized by disorders of sensation, of motion, or of the intellectual and moral faculties, singly or combined.

The diseases of the nervous system, characterized by disorders of sensation, are various, and may be treated of in the following order:—

I. AUGMENTATION OF SENSIBILITY.

SYNON. Hyperæsthesia, Hyperæsthesis; *Fr.* Hypéresthésie; *Ger.* Uebermässige Empfindlichkeit.

Hyperæsthesia may affect the several senses. In *Nyctalopia*—*Ger.* *Tagblindheit*, *Nachtsehen*—we have an example of it in the organ of vision;—the patient being unable to see distinctly in the full light of day, but distinguishing objects readily in obscurity. It

is a defect under which the *Albino* labours; and it may be caused by remaining a long time in dark places, as in mines.

The sense of hearing is at times amazingly exalted, giving rise to *hyperacusis* or *hyperacoë*, in which the patient is unable to bear the slightest noise. Both these affections, as has been shown, are common accompaniments of encephalitis and various cerebral diseases.

In *hyperosphresia* or *hyperosmia*, the sense of smell is sometimes augmented to an astonishing degree. The author has elsewhere referred to several strange cases, in which persons have been able to distinguish individuals from each other in the dark by this sense alone. (*Human Physiology*, 4th edit. i. 137: Philad. 1841.) In disease, this condition sometimes exists. A modern writer, (*H. Cloquel*,) refers to the case of a person affected with fever, who was unable to tolerate the disagreeable and overwhelming odour of copper, which was found to be exhaled from a pin that had dropped in his bed! and in cases of strange antipathies to certain animals, the sense of smell has detected their presence, when they were unobserved by persons in the apartment.

Hypergeusia or excessive sensibility of the organ of taste is occasionally met with, but not so frequently as the last.

In *hyperaphia*, or excessive acuteness of touch, the affection is at times partial; at others, it extends over the whole cutaneous surface; and is so excessive, that the individual cannot bear the slightest pressure. This condition is met with frequently, and often in persons labouring under neuralgia. Indeed, hyperæsthesia of the sense of touch is frequently one of the most prominent symptoms of that affection, and has often been regarded, but without adequate grounds, as evidence of irritation of the medulla spinalis, or what has been very unhappily termed, by a few, *rhachialgitis*. At times, this super-sensitiveness is premonitory of encephalic mischief, but, more frequently, it is met with in nervous and highly impressible individuals. The author has recently had a case of excessive hyperæsthesia of the lower extremities, which continued for months, and was unaccompanied by any manifest mischief in the nervous centres.

A highly exalted state of the sensibility—constituting general hyperæsthesia or supersensitiveness—is occasionally seen, in which the unfortunate sufferer is so “nervous,” as it is usually termed, that she cannot bear the slightest unusual impression to be made upon the senses without fainting, and has the cœnæsthesia or “common feeling” so highly developed, that the minutest changes of atmospheric density and temperature produce disagreeable sensations. It is unquestionable, that different persons are not equally sensible to the same irritants. Some do not feel the least inconvenience from the application of an ordinary blister of cantharides, whilst, with others, the suffering induced is almost intolerable. The difference is, doubtless, laid essentially in organization,

although habits of indulgence or resistance may favour or prevent its development.

Causes.—Extreme impressibility of the nervous system may be induced in various ways. It supervenes, at times, on profound and long-continued mental exertion, on want of sleep, great fatigue, and any agency that exhausts the nervous system; but it more frequently follows excessive evacuations of every kind—too copious blood-letting, or catharsis; a rigid diet; and, still more, abstraction of those excitants to which the nervous system may have been habituated,—as alcoholic liquors or tobacco. Some of the most distressing cases of supersensitiveness, which the author has witnessed, have occurred in persons, who had suddenly quitted chewing or smoking.

Treatment.—The treatment will have to vary with the cause. Wherever it is practicable, this will of course have to be removed. The tonic system of medication, with a nutritious, but by no means exciting diet, will have to be prescribed, and, if it be practicable, a thorough change of all the influences surrounding the individual should be advised,—such a change as travelling air and exercise are capable of affording. The moral and physical revulsion, in this way induced, is often most salutary, and it is frequently the only agency that is found to be productive of any benefit.

Narcotics and sedatives have been recommended, and especially, perhaps, lactucarium¹ and the hydrocyanic acid.²

¹ R.—Lactucar. ʒj.

Mucilag. acaciæ, ʒij.

Syrup. ʒiij.

Aquæ camphor. ʒiij.—M.

Dose, a tablespoonful, four times a day.

² R.—Acidi hydrocyanic. medicinal.

j.

Mucilag. acaciæ, ʒij.

Syrup. ʒj.

Aquæ, ʒj.—M.

The draught to be taken three times a day.

They are rarely of any service, and the more active narcotics, as opium, are found to be decidedly injurious: the super-sensitiveness may be diminished whilst the patient is under their influence, but it supervenes to a greater extent when the narcotic influence has passed away.

II. DIMINUTION, OR PRIVATION OF SENSIBILITY.

SYNON. Anæsthesia, Parapsis expers; *Fr.* Anesthésie; *Ger.* Unempfindlichkeit.

The existence of this condition in one-half the body, or in detached parts of it, is an additional proof of the distinctive character of the nerves of sensation and motion. The loss of power of the nerves of special sensibility, of vision, audition, olfaction, &c., which is confined to the nerves, does not fall under consideration here. General sensibility is, however, often lost by the condition of the nervous centres themselves, and, therefore, may be properly regarded in this place.

In certain cases, the nerves of general sensibility of one side of the body may be affected with anæsthesia, whilst those of the other

side are in a state of hyperæsthesia. Frequently, however, parts, distant from the nervous centres, are affected, and in a manner which does not admit of easy explanation. Thus, numbness of the fingers, or of a single finger, may announce the attack of cerebral hemorrhage; or occasional or constant numbness may affect portions of the extremity, without any indication of disease of the nervous system. Anomalous cases of this kind are, indeed, by no means uncommon.

The degree, to which the loss of feeling may exist varies. At times, it is total; so that boiling water or hot sealing-wax may be dropped upon the naked arm without pain being induced.

These cases are very difficult of explanation. At times, they are caused by tumours pressing upon the nerves, or by some interference with the continuity of those cords; but, at others, they admit of no explanation in the existing state of knowledge. The anæsthesia has, occasionally, extended to the degree, that the persons have lost all consciousness of existence. Such is said to have been the case with Baudelocque, who, for some time, considered himself dead. (*Andral.*)

Strange alterations in the sensibility of parts, and abolition of feeling as regards certain irritants, which usually elicit it strongly, are witnessed under the operations of the animal magnetizer. By impressions, made on the senses, perversion of the ordinary functions of the nervous system is induced, strikingly analogous to what we notice in catalepsy and hysteria, described elsewhere; and not more easy of explanation than those affections themselves. The effect, indeed, of the manipulations of the animal magnetizer, is to induce phenomena in the nervous system, which are eminently hysterical or *hysteroid* in their character. These collectively have been termed *Anesthésie extatique*. (*Andral.*)

Anæsthesia is occasionally produced by the poison of lead. Twenty-three cases are noticed by a recent writer. (*Tanquerel des Planches.*) In four of these, it was deep-seated; in seven, the loss of sensation was confined to the skin, and in twelve, the eye was affected. In the eleven cases of deep-seated and superficial anæsthesia, there was paralysis of the corresponding muscles in three; in four, the paralysis of motion and of sensation occupied different parts; and, in four, the loss of sensation was unaccompanied by loss of motion. In one case, amaurosis and anæsthesia of the skin existed together.

The lesion of sensation was always partial; sometimes being confined to certain parts of the abdomen, chest or neck, and sometimes to the limbs; and it shifted its seat or varied in extent. It generally makes its attack suddenly, and speedily attains its full extent. Sometimes, however, it is preceded by slight numbness.

Amaurosis has often been observed as a consequence of lead poisoning. (*Andral, Rognetta, Grisolle, Trousseau, Tanquerel des Planches.*)

Treatment.—In the obscurity as to cause and pathology, it is

difficult to lay down any general indication of treatment. The main object, doubtless, is to awaken the dormant energies of the nervous centres, or of the nerves connected therewith. With this view, excitants are demanded;—as epispastics, douches of hot water, the flesh-brush, electricity in the form of sparks or shocks, or of galvanism; acupuncture, applied either to the surface or along the vertebral column; moxa, &c. &c. Strychnia may likewise be employed internally; or half a grain may be sprinkled on a denuded surface to obtain the endermic action of the remedy.

It is scarcely necessary to say, that when the anæsthesia is produced by working in lead, the patient should quit his occupation immediately, and not resume it until he is perfectly recovered.

III. PERVERSION OF SENSIBILITY.

SYNON. Paræsthesia, Paræsthesis; *Fr.* Perversion de la Sensibilité.

The facts, connected with perversion of sensibility, are more curious than useful therapeutically. It may affect any one of the senses. The touch may exhibit it—*Paraphia*—so that errors may be constantly indulged in regard to the shape, size, consistence, weight and temperature of bodies.

The taste is also strangely perverted at times—*Parageusia*—and the most disgusting objects are taken as food with the highest relish. The longing of pregnancy is an exemplification of this perversion; as well as the singular perversion of taste observed in the chlorotic, who not unfrequently fancy slate-pencils, ashes, &c., in preference to articles that are eatable, and relished in health. Cases, indeed, are on record, in which men have been induced to eat human excrement. (*Andral.*) By custom, however, substances may become agreeable, which excited at first great disgust, as in the case of game, kept until it has attained a marked *fumet*.

The smell, too, is often perverted—*Parosmia*. The author was formerly acquainted with a lady, who scented her snuff with the tincture of assafœtida. Yet this may not be such a perversion of taste as it might at first sight appear. The orientals, indeed, regarded assafœtida as *le Manger des Dieux*, whilst with us it bears the name *Stercus diaboli*, and in the vernacular, *Devil's dung*.

The senses of vision and audition are likewise subject to various depravations. Perverted audition—*Paracusis*—presents itself in various forms—as in the *erethitic nervous deafness* of a recent writer, (*Kramer*), in which different sawing and other sounds are heard—in *tinnitus aurium*, double hearing, &c. &c.

Perverted vision—*Paropsis*—exhibits equally strange anomalies;—as double vision, *Diplopia*, *Dittopia*, *Visus duplex*; Ger. *Doppelsehen*:—seeing the half of objects—*Hemiopia*, *Hemiopsia*, *Visus dimidiatus*; Ger. *Halbsichtigkeit*:—seeing objects that have no existence, as cobwebs, muscæ volitantes, sparks before the eyes, &c.—*Pseudoblepsia*, *Metamorphopsia*; Fr. *Berlue*; Ger. *Falschsehen*, *Gesichtstäuschung*, &c. &c.

Many of these are symptomatic of various diseases of the nervous system, and will fall under consideration elsewhere.

Treatment.—Where these various perversions are dependent upon any morbid condition, they will disappear on the removal of the primary affection; often, however, those of the smell and taste are mainly dependent upon habit, and can only be rectified by a properly adapted moral management.

IV. HEADACHE.

SYNON. Cephalalgia, Cephalæa, Dolor capitis; *Fr.* Céphalalgie, Mal à tête; *Ger.* Kopfschmerz.

Headache may be general or confined to a part of the head, and it is a common concomitant of disorders of various organs. "It appears, indeed, under so many forms, is produced by such a number of causes, is in its nature so variable, and is connected with such different morbid lesions, that a perfect knowledge of it, with a view to treatment, is obtained with the greatest difficulty." (*J. H. Bennet.*) It is a frequent consequence of a debauch, and, at such times, is entirely nervous. It appears, too, to arise idiopathically, to be purely nervous, and little connected with the condition of the blood-vessels. On other occasions, it is a symptom of ordinary indigestion, the pain being at times seated at the anterior, and at others at the posterior, part of the head.

Causes.—The causes of headache are extremely various. It is a common symptom in many diseases, and, consequently, forms a part of them. It has been supposed by some (*Georget, Calmeil*) that a predisposition may be laid in organization; and the female sex, from greater nervous excitability, appears to be more liable to it. In such as are especially predisposed, an attack is brought on by the most different, and, at times, singular causes. Some cannot take ice cream and champagne, mixed; others the smallest quantity of milk, &c. &c. without the most rending headache resulting. It is impossible, indeed, to enumerate all the causes of headache: there is hardly a disturbing agency but may occasion it.

Treatment.—In the treatment of headache, the cause must be carefully investigated, and, if practicable, removed. When produced by a debauch, the evacuation of the contents of the stomach, and the subsequent exhibition of soda water, will afford essential relief: usually, however, in such cases, time is necessary, and, commonly, the employing of the stomach in its accustomed operations when the dinner hour arrives, and the use of a few glasses of wine or of any alcoholic liquor, will remove it.

When it arises idiopathically, it may usually be allayed by full doses of narcotics, administered internally as well as externally. The strychnia¹ and the extract of aconite have been administered with good effect in nervous headache.

¹ R.—Strychniæ, gr. iij.

Alcohol, ʒj.—M.

Dose, 6 to 24 drops, twice or thrice a day.

The freshly prepared extract of aconite was given in half grain doses repeated every two or three hours. (*T. H. Burgess.*)

When headache is connected with polyæmia or evidences of hyperæmia of the brain, blood-letting will be the necessary agent. When caused by indigestion, it must be treated by remedies appropriate to that condition.

a. Sick Headache.

SYNON. Cephalalgia spasmodica, Cephalæa spasmodica, C. nauseosa.

In the ordinary sick headache, which is characterized by rending pain at the top of the head, with violent retching and vomiting, the circulation being generally but little affected, and which appears to be essentially nervous, inasmuch as it is often brought on by looking at any dazzling object, by too tight ligatures about the head, or by a comb pressing too powerfully upon it, no single remedy affords signal relief. To prevent the violent retching, warm water, with or without the addition of a little flour of mustard, or chamomile tea, may be freely allowed: a sinapism may, also, be applied to the stomach, and opiates at times may be administered with benefit. Generally, after the pain has continued for a time, the patient sinks to sleep, and wakes about the middle of the day—if the attack have commenced in the morning—nearly, if not entirely well. The attacks are extremely irregular in their recurrence, and certainly not marked by periodicity.

In all the forms of nervous headache, immediate relief is often afforded by the application of strong counter-irritant lotions to the forehead or temples. These may consist essentially of a strong solution of ammonia.

R.—Liq. ammon. fortiss.

Sp. camphor, āā ʒj.—M.

A piece of cotton or linen, folded six or seven times, may be impregnated with the lotion, and be kept upon the part for a few minutes, care being taken that the ammonia does not reach the eyes or nose.

An analogous lotion has been much used in Great Britain and this country—"Granville's antidynous lotion," (see the author's *New Remedies*, 3d edit. p. 104: Philada. 1841); and another has been proposed still more recently. (*Raspail.*)

R.—Liq. ammon. part. 100.

Aquæ destillat. part. 900.

Sodii chlorid. part. 20.

Camphor. part. 2.

Essentiæ rosæ, q. s.

Solve.

b. Hemicrania.

SYNON. Cephalæa hemicrania, Megrim; Fr. Hémicrâne, Migraine; Ger. Hemikranie, halbseitiges Kopfweh, Migräne.

This word has been variously corrupted. From hemicrania has been formed *Migrania*; Fr. *Migraine*; English, *Megrim*. It is cephalalgia confined to one half the head; as *clavus hystericus*—Fr. *Clou hystérique*—is headache confined to a small portion of the head, at times to not more than can be covered by the finger, and

as it is not unfrequently accompanied by hysteria, or occurs in hysterical individuals, it has received the epithet hysteric—*hysteric nail*—Sydenham having compared the sensation to that of a nail driven into the scalp.

Hemicrania returns periodically in many cases; and, consequently, falls under the *Cephalalgia intermittens* of many writers; but, by some, it is considered to be a form of neuralgia, and is satisfactorily treated by remedies appropriate to this condition of the nerves.

A recent pathologist (*Piorry*) regards one form of the disease to be neuralgia of the iris. Persons, he says, who fatigue the eye, experience headache, and seek obscurity to get rid of the pain; the eyes are red, and in hemicrania there is vomiting as in certain operations of the eye.

Hemicrania occurs at all ages, but not so frequently before the period of puberty; and it is believed, that it is capable of transmission from parent to child; in other words, that a decided predisposition may, in this way, be laid in the organization.

At times, the attack of hemicrania is preceded by depravations of vision and audition, and the stomach exhibits signs of derangement by the presence of nausea and vomiting, frequently of an acid matter. At others, there are no premonitions of the attack, which is excessively severe, often restricted to one side of the head, and affecting the forehead and temples more especially. Although there is no encephalitis, the encephalon is remarkably sensible to light and to sound; and the skin, especially of the parts affected, cannot tolerate the slightest touch. Although the intellect may be clear, strange perversions of the senses are occasionally witnessed; numbness and sense of formication, with tremors of the limbs; perversion of the sense of taste; diplopia, and sundry other depravations of vision; with tinnitus aurium and other strange noises in the ears.

The stomach is sometimes disordered during the paroxysm, and, at others, not; but the circulation is unaffected.

During the severity of the pain, the secretion from the lachrymal glands is often profuse; and so much irregularity is induced in the organs of secretion generally, that jaundice supervenes. The occurrence of jaundice in states of high nervous excitement is indeed not uncommon. One of the most interesting cases, that ever fell under the author's care, to which reference is made under the head of Jaundice, was induced in that way.

The paroxysm does not generally continue longer than two or three hours; although, at times, it far exceeds this. The periods of its recurrence are very irregular; sometimes, only two or three times a year; at others, however, an attack occurs every week, and even oftener than this.

Treatment.—As in all paroxysmal attacks, much cannot be done. All sources of irritation must, of course, be avoided. Cold water may be applied to the head either in the form of lotion, or in

that of the douche from the spout of a teapot held a considerable distance above the head, provided the hyperæsthesia of the surface will admit of it.

Should evidences of hyperæmia exist to a great extent, so that there is danger to the encephalon from this cause, blood may be drawn from the general system, or locally, but this can be rarely needed, and the author has seen serious evil arise from repeated bleeding during the paroxysms practised under the dread of congestion or hyperæmia of the encephalon.

Carbonic acid—as contained in soda water, or given off from the ordinary soda powders—is often extremely grateful; and morphia, belladonna, and other narcotics, have been of service in some cases, but not in others. Belladonna has also been used externally in the following combination:

R.—Aq. lauro-ceras. ℥iv.
 Æther. sulphuric. ℥j.
 Ext. belladonn. ʒss.—ʒj.—M.
 To be applied as a lotion to the head.

When narcotics are administered, the dose should be large, and repeated so as to produce the full effect.

Attention should be paid to the condition of the organs of digestion; and if any source of irritation exist there,—either in the form of food, morbid secretions, or inflammation—they must be removed by the appropriate remedies.

During the attack, the excruciating pain may be relieved, at times, by the application of the counter-irritant lotions, recommended under the last variety of headache.

A recent writer (*Dufresse*) has published the history of a case, in which hemicrania and facial neuralgia were cured by compressing the primitive carotid of the affected side.

It is, however, during the interval, that therapeutical agents should be most energetically employed; and if the paroxysms recur frequently, great care may be demanded to diagnosticate the actual pathological condition. Usually, the indication will be—by appropriate tonics, but not by diffusive excitants—to induce a new action in the nerves of the stomach, and, through them, on the system of nutrition generally. With this view, after the stomach has been cleared by a gentle emetic, (pulv. ipecac. gr. xx.,) and the intestinal canal by a mild cathartic,¹ the carbonate of iron may be given twice a day in the dose of half a drachm in a little sugar and water, or molasses; and this dose may be gradually increased until, at the expiration of a month, the patient takes one drachm twice a day.

¹ R.—Pulv. rhei. gr. x.
 Hydrargyr. chlorid. mit. gr. iij.
 Pulv. zingib. gr. v.—M.

Should signs of gastric irritation arise during its administration, the cathartic may be repeated; but it is very important that the tonic should not be wholly discontinued, and that its use should be

persevered in for at least a month, before much amelioration can be expected.

In one of the most severe cases of hemicrania, that the author ever saw, and which—under the idea of encephalic hyperæmia—had been treated by blood-letting, on each attack, so that the patient—a female—was compelled to be bled once or twice a month, and when the author saw her was oligæmic and exceedingly impressible—the carbonate of iron, given as above directed, entirely restored her to her family, to which she had been wholly unable to attend for months previously. Since then—twelve years ago—she has had no attack.

In like manner, when the paroxysms exhibit anything like periodicity, the salts of quinia may be prescribed;¹ the sulphate, mixed with snuff, and snuffed up the nose, has been found useful.

¹ R.—Quiniæ sulphat. gr. x.
Acid. sulphur. dil. gtt. viij.
Aquæ, ℥v.—M.

Dose, a third part, every two hours, prior to the expected paroxysm.

The preparations of arsenic, and the different antiperiodics recommended in intermittents, may likewise be prescribed.

The treatment of clavus hystericus resembles that of nervous headache and hemicrania.

It is proper to observe, that severe cephalalgia is at times owing to inflammatory or other mischief in the frontal sinuses, which may require attention.

V. ACRODYNIA.

SYNON. Erythema acrodynia, (*Bielt*;) *Fr.* Acrodynie.

This name, from *ακρος*, “extremity,” and *οδυνη*, “pain,” was given to an epidemic that prevailed in Paris, in the summers of the years 1828 and 1829; the prominent symptoms of which were pain in the ultimate extremities,—as in the palms of the hands, and the soles of the feet.

The pain was compared by the patients to that which would be produced by needles or pins run into the parts. It was augmented by pressure, continued intense for a time, then diminished, and after a time disappeared, leaving, however, the skin deprived of its usual feeling, and red; the cuticle separating in large flakes. This change of the cuticle occurred occasionally three or four times; and the colouring matter became abnormous,—the surface appearing of a blackish brown approximating to that of the negro.

This was the usual course, but some of the sick suffered from the pain in the hands and feet only.

Occasionally, other parts of the dermoid texture sympathized; the mucous membrane of the intestines becoming especially irritated, as indicated by vomiting, redness of tongue, pain at the pit of the stomach, diarrhœa, colic, &c. &c.

In other cases, however, the digestive organs were little, and in

others, again, not at all deranged. The only constant symptom, indeed, was the pain in the hands and feet.

The duration of the epidemic was a month or six weeks; and it disappeared totally before winter. It was a precursor of cholera, and not less strange in its nature and causation than the cholera itself. Not a single individual, however, died of it, although great numbers were attacked, and these chiefly of the poorer classes, and in parts of the French metropolis where the population was crowded together.

Numerous investigations were made into the pathological characters of the disease; and multitudinous trials of remedial agents; but no clear light was thrown on its pathology; and in the latter periods of the epidemic, the therapist confined himself to the use of the warm bath, fomentations, frictions and emollient and narcotic cataplasms. (*Andral*.)

About the same period, a singular and similar complaint, the *Dengue*, appeared in the southern parts of this Union, and in the West Indies. It is described in another part of this work.

VI. ECLAMPSIA.

SYNON. Sympasie convulsio.

Under the term eclampsia we may consider the epileptiform convulsions of children, which occur generally during dentition; and those that supervene during gestation or in the parturient state. (*Rostan*.) The term has been restricted, however, by some to clonic convulsions, in which there is loss of consciousness, but without foaming at the mouth,—a definition, which would include convulsions of the gravid, parturient, and childbed state. (*Andral*, *Most*, *Kraus*.)

a. Convulsions of Children.

SYNON. Eclampsia, Epilepsia acuta infantum, E. febrilis infantum; *Fr.* Convulsions des enfans; *Ger.* Eklampsie, Epilepsie der Kinder, Fraisen der Kinder, Krämpfe der Kinder, Scheurchen der Kinder, Convulsionen der Kinder.

This affection is by no means uncommon. Prior to two years of age, the infantile frame is extremely impressible; and, on the application of certain exciting causes, is readily thrown into convulsions.

Diagnosis.—The symptoms cannot be mistaken. At times, without any dulness, or premonition, but more commonly after having exhibited signs of indisposition for a longer or shorter period, the child falls down in a state of insensibility, with convulsive agitation of the muscles of the face, and of the voluntary muscles of the upper or lower extremities, or both. The eyes are turned up; the face becomes livid; and there is, at times, slight foaming at the mouth, although this last symptom is commonly wanting.

The state of unconsciousness, and of convulsion, varies as to duration. When the paroxysm is slight, all the symptoms may pass away in a few minutes; but, more frequently, the duration is

greater, and the child gradually recovers its consciousness, or may remain dull and lethargic for hours afterwards.

It does not often happen, that a fatal termination occurs in the first paroxysm; but if the pathological cause of the convulsions exists to a serious degree, the child does not recover its wonted sprightliness, and fit follows fit, until death relieves the little sufferer.

The bills of mortality of our cities exhibit, that infantile convulsions are a very dangerous affection, but still the large majority of cases end favourably.

Causes.—There is, doubtless, in children predisposed to convulsions, a peculiarity of constitution, which is occasionally derived from progenitors, who have themselves been similarly affected.

The disease is likewise, at times, of a family character, where the progenitors have been wholly free from it. A modern writer (*Andral*) alludes to a family of five children, all of whom died of convulsions, although the parents had not suffered from them.

It has been already remarked, that, under the age of two years, there is an unusual impressibility of the nervous system. Owing to this cause, the surgeon avoids undertaking any serious operation, under the apprehension that he might develop such impressibility to an injurious degree. There is doubtless, also, a vast difference in children, as to the degree of this impressibility—some being infinitely more affected than others by impressions made on the senses; and more liable to disturbed dreams and to sudden affrights. It has been asserted, that such children can be recognized by the enormous size of the brain; by precocious intelligence; mobility of facial expression—blushing and turning pale suddenly, and under the influence of the most trifling causes. (*Andral, Dubois d'Amiens.*) To a certain extent this is true, but we have not observed the coincidence of excessive development of the brain in such cases.

The disease is rarely, perhaps, centric. It is almost always dependent upon eccentric causes; and generally, perhaps, upon some source of irritation in the digestive tube. Dentition is commonly invoked as the most frequent cause; the irritation, produced in the nerves distributed to the gums, being propagated to the nervous centres, and reflected to the muscles, which are thrown into convulsions. In like manner, food of an indigestible nature—or, if digestible, in too great quantity—is an ordinary exciting cause, particularly in those who are predisposed to the disease by an organization derived from their progenitors.

Intense mental emotions—as great terror, and severe bodily pain—may likewise induce them.

The state of the circulation—especially of that of the encephalon—is unquestionably concerned in the causation of convulsions. We observe some children always affected in this manner on the supervention of fever, but whether it be the hurried circulation, or its cause, that induces them, may admit of doubt. Hyperæmia

of the encephalon, idiopathic or symptomatic, has, however, generally been considered intimately associated with their occurrence. This may be, and doubtless often is, the cause in children of a full habit, who exhibit a strong febrile movement, and plethoric condition, before and during the paroxysm; but we are quite satisfied, that they more frequently arise from an irritability and mobility of the nervous system, which is totally unconnected with such a condition of the vessels of the system in general, and of the encephalon in particular; and, consequently, that the depletion so indiscriminately employed is by no means adapted for all cases.

In those, for example, who are predisposed by organization to convulsions, and in whom they are induced by some irritating cause, depletion could scarcely fail to add to the mobility. Moreover, it has been before observed, that convulsions may be induced—like coma—by loss of blood; and, that from opposite pathological states, we may have the same disordered actions induced. Under such circumstances, the most careful attention is demanded on the part of the practitioner to decide, whether he has to combat a polyæmic or anæmic condition of the encephalic vessels.

As in the case of other neuroses, the circumstance of one attack having occurred lays the foundation for others; generally, however, as the child grows older, the tendency diminishes, and rarely persists—even in those who are predisposed to them by organization—beyond the period of puberty.

Pathological characters.—These are not distinctive. At times, one or other of the pathological conditions of the encephalon, already described—hyperæmia, or mollescence, or encephalitis, is met with; but, at others, no morbid appearances are perceptible. The irritation of the encephalon has been produced by irradiations proceeding from other parts of the economy, and no traces may be left on the nervous centres.

Treatment.—This must, of course, vary according to the causes and symptoms. If these denote encephalitis or hyperæmia of the encephalon, blood may have to be taken from the general system, or by means of leeches applied to the temples; but, as the general pathological condition is great impressibility of the nervous system, acted upon in many cases by derangement of the primæ viæ, the exciting causes must be removed where practicable. With this end, if a tooth be pressing against the gum, it must be set at liberty; and even if it have not advanced far enough for this purpose, the scarification of the gums will afford relief. Almost always, too, it will be advisable to administer a gentle emetic,¹ with the view of removing any offending contents of the stomach, and after the emetic has done operating, to administer a cathartic, (hydrarg. chlorid. mit. gr. v.)

¹ R.—Antim. et potass. tartr. gr. ij.

Aquæ, ℥j.—M.

Dose, a fourth part every twenty minutes until it operates.

If the child be still in the fit, friction may be employed over the

surface of the body; and it may be placed in the warm bath; but this, in the hurry and confusion which always prevail, is attended with so much inconvenience, that it has been abandoned by some practitioners.

Should it be considered urgent to evacuate the contents of the bowels, by way of inducing revulsion in the lower part of the intestinal tube, an ordinary domestic enema of molasses and salt, or gruel and salt may be administered; or, if the child be very young, a suppository of yellow soap will answer every purpose.

Should the paroxysm persist, the feet may be placed in sinapised pediluvia, and the cold douche be applied to the head from the spout of a teapot.

In the asphyxia, occasionally seen in the convulsive fits of children, it has been advised to practise artificial respiration. (*L. Cape.*) In the case of an infant, five days old, which had a succession of violent convulsions for thirteen or fourteen hours, and, on the average, a fit every hour, Dr. Cape was satisfied, that the child would have been lost, had not artificial respiration been practised, by breathing into the mouth of the infant from his own, closing the nostrils, compressing the thorax after each inflation, and observing the natural periods of frequency as far as possible. By means of the artificial respiration, the colour—especially of the face and lips—turned from purple to red; but still there was no breathing, until a convulsive gasp announced the termination of the fit.

In the intervals, every care must be taken that the child's diet is of the proper character. No fruits having skins, nor any kernels, which are always difficult of digestion, should be permitted; the bowels should be kept free; and due pains be taken to strengthen the nervous system by exercise in the open air, and by the tepid or cold bath. Where the predisposition laid in organization is considerable, the only safety for the child is in avoiding the exciting causes.

Recently, a peculiar form of *infantile convulsions* has been described. (*J. W. West.*) It seems to consist in bobbings of the head forward, which are slight at first, but, in process of time, may become so frequent and powerful as to cause a complete heaving of the head forwards towards the knees, and then immediately relaxing into the upright position,—something similar to the attacks of *emprostotonos*. These bowings and relaxings, in the case of Mr. West's own son, were repeated alternately at intervals of a few seconds, and from ten to twenty or more times at each attack, which would not continue more than two or three minutes. Of these attacks, the child had two, three, or more in the day, which came on whether he was sitting or lying.

The child did not lose its consciousness. Mr. West, having met with no case similar to it, applied to Sir Charles Clarke, Dr. Locock, Sir Astley Cooper, and others. The first of these gentlemen had seen four cases, and from the peculiar bowing of the

head, he called it the *Salaam convulsion*. Dr. Locock had seen two cases, and Sir Astley Cooper none like it. Sir Charles Clarke knew the result of only two of his cases. One recovered perfectly; the other became paralytic and idiotic, and died at the age of 17. Mr. West had heard of two other cases, which lived—one to the age of 17; the other to 19; both were idiotic.

As no opportunity has occurred for necroscopic researches in these cases, the pathology of the disease is unknown. It would be curious to investigate, whether the lesion give any countenance to the views entertained by a distinguished physiologist, (*Magendie*), in regard to the cerebral seat of the forward impulsion, referred to at page 224 of this volume.

b. *Convulsions in pregnant or parturient women.*

SYNON. Eclampsia gravidarum et parturientium, Puerperal convulsions; *Fr.* Convulsions des Femmes enceintes, en Travail et en Couche; *Ger.* Convulsionen der Schwangeren, Gebärenden, und Wöchnerinnen.

Pregnant and parturient females may be attacked with convulsions, which are decidedly hysterical; and with others, which are more of an apoplectic character; but the convulsions, which are most frequently met with, and seriously complicate the parturient state, are epileptiform.

A recent writer, (*F. Churchill*), has collected the following numerical estimates of cases, that have occurred in the practice of several distinguished obstetricians:—

In 1,897 cases of labour,	<i>Dr. Bland</i>	met with	2 cases of convulsions.
" 10,387	"	" <i>Dr. Jos. Clarke</i>	19
" 2,947	"	" <i>Dr. Merriman</i>	5
" 640	"	" <i>Dr. Granville</i>	1
" 398	"	" <i>Dr. Cusack</i>	6
" 848	"	" <i>Dr. Maunsell</i>	4
" 16,654	"	" <i>Dr. Collins</i>	30
" 399	"	" <i>Dr. Beatty</i>	1
" 1,266	"	" <i>Dr. Ashwell</i>	3
" 2,510	"	" <i>Dr. Mantell</i>	6
" 600	"	" <i>Dr. Churchill</i>	2
" 20,357	"	" <i>Mad. Boivin</i>	19
" 38,300	"	" <i>Mad. Lachapelle</i>	61

It is idle to attempt any general average from these estimates; but, if we were to esteem them correct, and to exhibit a fair proportion of cases of convulsions to the whole number of cases of parturition, they would yield a ratio of about 1 in 610. Dr. Churchill omits the reports of Mesdames Boivin and Lachapelle, as he does not know how far the one may include the other; and reckons 79 cases of convulsion in 38,306 cases of labour, or about 1 in 485 cases.

Diagnosis.—The symptoms of the convulsions, that take place at the latter period of utero-gestation, and during parturition, are essentially those of epilepsy; they would seem, indeed, according to a recent writer, (*D. Davis*), to be almost absolutely identified;

excepting, that, in puerperal convulsions, "he has never been able to trace a recollection of the sensation called *aura epileptica*."

Numerous cases, however, of true epilepsy occur, in which no *aura epileptica* preceded the paroxysm. Similar premonitory symptoms in other respects are witnessed; but, generally, in the convulsions now under consideration, there is more evidence of vascular hyperæmia, as indicated by tumefaction and flushing of the face, and injection of the vessels of the tunica conjunctiva. By some, an intense pain in the forehead has been described as an important prodromic symptom, (*Jas. Hamilton, Senr.*); and, by others, a severe pain in the stomach, which has been noticed in the worst cases. (*Denman.*)

At times, however, as in epilepsy, there is no warning;—the pupils become dilated, the face more tumid and injected; the eyes fixed, and the patient loses all consciousness, and is temporarily convulsed. The respiration is at first irregular; and being forced through the closed teeth, and the frothy secretions, has a peculiar hissing sound, but subsequently becomes almost suspended.

The paroxysm is not generally of long duration. Sometimes, in a few minutes, the convulsions become less and less violent, and gradually subside; and, in a variable period, the disordered actions pass off, leaving the patient lying quietly, but with the pulse usually more accelerated. Occasionally, consciousness is entirely restored, great sense of debility, headache and confusion alone remaining; but in other, and much the less favourable cases, consciousness is imperfect, and the confusion of intellect is striking; whilst in others, again, she lies in a state of total insensibility, with more or less sibilant or stertorous respiration.

After an uncertain interval, there is a return of the convulsions with a succeeding interval; and this alternation may take place repeatedly; as often as eighteen or twenty times, in the course of the twenty-four hours. (*F. Churchill.*)

Even where recovery takes place, it may be very gradual. The state of coma may remain for a considerable time; or the patient may continue deaf, or blind, or incapable of speaking or moving,—phenomena, which indicate the serious modification induced in the functions of the encephalon. In some of the fatal cases, the patient may lie comatose for some time, and ultimately die with symptoms greatly resembling those of apoplexy. (*Campbell, Blundell.*)

It is very well known, that not a few instances do occur, wherein the fatal blow is struck at the very onset, and that some women never speak, and never show the smallest sign of reason or sensation, from the moment of invasion, but sink at once into the stertorous apoplectic sleep, that leads rapidly to the sleep of death. (*Professor Meigs, of Philadelphia.*)

The cases of convulsions, that occur during parturition, would appear to leave a great tendency to abdominal inflammation, a fact to be borne in mind by the practitioner. (*Denman, Collins, Churchill.*)

The danger of puerperal convulsions is great. From the reports of different observers collected by Dr. Churchill, it would seem, that about one in four proves fatal. It would be consolatory, were it correct, as stated by the same writer, that after complete recovery, the patient is not more liable to similar attacks in her after pregnancies: yet it is proper to remark, that it is not the opinion of all observers, (*Locock*;) and Dr. Churchill himself remarks, in a former page of his valuable work, that “persons previously afflicted with convulsive affections are certainly predisposed to them at this time.”

Causes.—These are not always clear. It would appear to be necessary, that there should be a predisposing condition of the great nervous centres; yet, it is not easy to say in what that predisposition consists. The disease is rarely, perhaps, centric, that is, commencing in the nervous centres. The immediate cause may be seated elsewhere;—doubtless, generally in the uterus; but it may be in the stomach or bowels; whence it acts upon the great nervous centres eccentrically. It has been ascribed to intemperance; to liability to convulsive affections—from previous attacks; to mental emotions—as frights; to hyperæmia of the encephalon, induced during the uterine contractions; and to atmospheric influence, (*Locock, Denman, Dugès, Jr., Ramsbotham, Churchill*;) yet, it must be admitted, that the etiology is sufficiently obscure: nor do the

Pathological characters throw light on the nature of the diseased condition. In numerous examinations that have been made of those who died during the existence of this form of convulsion, no alteration whatever has been found in the condition of the encephalon, (*Cruveilhier, Baudelocque, Collins*;) in other cases, the vessels have been turgid with blood, and, in others, serum has been found effused into the ventricles, or into the great cavity of the arachnoid.

The affection would appear to belong unequivocally to the neuroses, as we have defined them. Whatever influence is produced on the neurine is certainly as inappreciable as in many of the other affections, involving aberration of the functions of sensation, volition, and mental and moral manifestation, which fall under this division of diseases of the nervous system.

Treatment.—Whatever may be the condition of the encephalon in this alarming affection, almost all writers appear to be agreed, that our hopes of safety must rest on diminishing the amount of the circulating fluid, and on diverting the morbid actions from the encephalon towards other parts of the economy. With this view, blood should be taken in a full stream, so as to make a decided impression on the system; the quantity to be drawn must be judged of by the urgency of the case. It has been said, that “it is scarcely worth while, almost, to open a vessel to draw off eight or twelve ounces of blood. The patient ought to lose from thirty to sixty ounces at one venesection, if possible; and if signs of faintness

appear, they should be hailed as the harbingers of success." (*Professor Meigs.*)

Copious bleedings have generally, indeed, been advised, (*Denman, Blundell*;) and some consider bleeding from the jugular vein to be peculiarly advantageous, because, in this mode of operating, blood is taken away from the head. (*Blundell.*) This is true, however, as regards the external part of the head only. To relieve the *internal* part, bleeding from the *external* jugular can afford no more relief than when the operation is performed at the bend of the arm.

It may be necessary to repeat the bleeding again and again, and should there be any objections to the farther employment of general blood-letting, leeches or cupping on the temples or the nape of the neck may be substituted. The whole plan of treatment, recommended in hyperæmia of the encephalon, and in encephalitis and meningitis, is indeed appropriate here; and advantage might accrue from compressing the carotid arteries, in the manner recommended in several convulsive affections. (See the author's *New Remedies*, 3d edit. p. 500, Philad. 1841.)

Much difference of sentiment has existed in regard to the administration of opiates, after active antiphlogistics have been employed, and the disease is somewhat subsiding. Such has been the opinion of some excellent observers. (*Denman, D. Davis, J. Ramsbotham, Collins.*) Mercury, given so as to affect the system, has also been beneficial. (*Churchill.*)

It need scarcely be said, that whilst it is considered advisable to diminish the amount of the circulating fluid, but little nourishment should be permitted; and that the patient should not be allowed to use watery drinks freely, inasmuch as under the copious draughts from the circulatory system, they would not fail to pass readily by imbibition through the coats of the blood-vessels, and supply the loss that had been sustained. All irritations of every kind ought also to be carefully avoided, and hence the apartment should be kept dark, and as free from noise as possible.

In regard to the propriety of delivering the child, all are of accord that it is essential, provided it can be done without injury—the convulsions generally ceasing after delivery has been accomplished. It is universally admitted, however, that in the first instance we ought scarcely to interfere beyond rupturing the membranes, which sometimes advances the progress of the labour. Turning has been frequently recommended; but it would seem to be a very hazardous measure. (*Churchill.*) In all the three cases, in which it was employed by one practitioner, (*Ramsbotham*;) it proved fatal; and a recent writer (*Collins*) is strongly opposed to it. When the head has descended so far that the forceps can be applied, they may be had recourse to with much propriety.

Continued ill health is apt to follow puerperal convulsions; and much care on the part of the practitioner is demanded, to avert many evil affections, which are amongst their sequelæ. (*Professor Meigs.*)

VII. EPILEPSY.

SYNON. Epilepsia, Morbus caducus, M. comitialis, M. herculeus, M. lunaticus, M. sacer, M. divinus, Clonos epilepsia, Syspasia epilepsia, &c., Falling sickness; *Fr.* Épilepsie, Mal caduc, M. divin, M. Saint Jean, M. de terre; *Ger.* Fallsucht, Jammer, böses Wesen, schwere Noth.

This disease strikingly resembles eclampsia. It comes on in paroxysms, which are occasionally periodical, but generally recur at irregular intervals, and, at times, at distant periods. A recent writer (*Andral*) places it, not among the convulsions, but in the class of "complex neuroses;" and the reasons he assigns are,—that convulsions are not the only phenomena, that lesions of sensibility and intelligence are coexistent, and, moreover, he affirms, convulsions are not always present, and, in hospitals for the treatment of these diseases, they give the name *petit mal* to epilepsy without convulsions. It will be seen, presently, with what propriety this division can be made.

Diagnosis.—Frequently, before an attack of epilepsy, the patient has premonitory or prodromic symptoms, similar to those which foretell nervous affections in general,—as depravation of one or more of the senses; flashes of light, or dark spots before the eyes; tinnitus aurium; vertigo; confusion, or slight intellectual aberration; cephalalgia; numbness of some part of the body, as of a finger or a toe; sense of formication or disagreeable itching, &c. &c. Along with these symptoms, referable to the organs and functions of animal life, the organic functions may be disordered; and, hence, palpitation, or irregularity in the action of the heart, with violent pain in the chest, vomiting, &c. are occasionally present.

The *aura epileptica* has been described by authors as a common prodromic symptom; but, according to the author's experience, it rarely exists as described. It is said to be a peculiar sensation originating in the extremities—as if an aura or air were passing upwards towards the heart or the brain, and when it reaches either of these vital organs, the individual immediately falls, deprived of all consciousness, and the paroxysm commences.

Whether these precursory symptoms have presented themselves or not, the epileptic falls suddenly, as if at once deprived of all sensation, volition, and mental and moral manifestation; sometimes uttering a distressing cry, apparently of surprise, (*Beau*;) at others, moaning; and, at others, again, leaping, running, or turning rapidly round before he falls. The British and American practitioners make no distinction of the disease into varieties or stages, but the French pathologists—many of them at least—adopt three varieties: first, perfect epilepsy—*grand mal*; secondly, vertigo, confusion and partial convulsions, *petit mal*, *épilepsie vertige*; and thirdly, *absence*, in which there is no convulsion, but simply loss of sensation and intelligence. This division is, however, unnecessary, as the only difference between the *grand mal* and the *petit mal* is in the intensity of the symptoms, whilst it may admit of question, whether

the term epilepsy can be applied with propriety to any affection in which convulsions are not a symptom.

When the patient falls, deprived of consciousness, the face is observed to be tumefied and livid; the mouth distorted and generally foaming; the eyes turned up and fixed; the pupils dilated, or contracted, but immovable; the jaws so firmly closed, that the tongue is sometimes seriously injured; and, at others, even the teeth are broken. The convulsions are general, and affect especially the muscles of voluntary motion; but, at times, they implicate one side more than the other; the inspiratory muscles, likewise, participate in the convulsions, so that the respiration becomes laborious; and the inspirations are short, frequent and loud; the circulation is occasionally unaffected, but generally it is disturbed; occasionally there is a momentary arrest of the respiration, "and if pleximetric percussion be practised at this moment, the heart appears excessively hard to the finger which percusses," (*Piorry*;) and the excretions are frequently passed involuntarily. This state does not usually continue longer than a few minutes, before the violence of the distortions diminishes; the vascular turgescence disappears; the face becomes pale; the surface bedewed with perspiration, and the patient is in a state of great prostration; in many instances remaining devoid of consciousness, and completely comatose, with loud respiration. This condition may persist for twenty minutes or half an hour; at the expiration of this time, the patient begins to recover; but he still complains of confusion, with lassitude, and pains in the head and limbs; having no knowledge of what has occurred, except from his feeling of languor, and the wounds and bruises he may have received during the paroxysm.

At other times, furious mania succeeds, which may require restraint. To this condition, which may continue from a day to two or three, the terms *Mania epileptica*, and *Epileptic delirium* have been given.

The intervals between the paroxysms of epilepsy vary greatly. Some do not occur oftener than once a year; but, more frequently, they return repeatedly; at times, every month or week; and, occasionally, once or oftener during the day.

When the paroxysms are very frequent, they are not always fully formed; the patient may merely lose consciousness, and exhibit slight convulsions in the muscles of the face, which speedily, however, pass off, and may be scarcely noticed by those present.

Most commonly, in confirmed epilepsy, the attacks come on during the night, and not long after the patient has gone to sleep, so that he may have no knowledge of the fact except from the feelings of languor and lassitude which he experiences the following morning. The cause of this has been supposed to be the horizontal position, which facilitates the flow of blood to the head by the arteries; but it is more probably owing to inappreciable modifications of the nervous centres themselves during sleep, which are favourable to the production of the epileptic condition.

Between the paroxysms, the patient is at times healthy; but, more commonly, he suffers more or less from impairment or depravation of some of the senses, or from dulness of the intellectual faculties; and, in long protracted cases, this frequently ends in a state approximating to, if not identical with, fatuity. It has been affirmed, indeed, that of any given number of epileptics, two-thirds, at least, are in a state of idiocy or dementia. (*Dubois d'Amiens.*)

Of 385 epileptic cases recorded, (*Esquirol, Calmeil,*) 46 had hysteria, 12 monomania, 30 mania, 145 dementia; 34 were furious, 8 idiotic, 50 generally reasonable, but subject to loss of memory or extravagant ideas; some had slight delirium, and all a tendency to dementia; and, in the remaining 60, the intelligence was perfect. (*J. H. Bennett.*)

Epilepsy may terminate in health, especially where it occurs prior to the age of puberty. At this period, owing to the evolution that takes place, the morbid condition is changed, and the disease disappears. After the age of puberty, these salutary changes are scarcely to be expected, although the disease does occasionally cease spontaneously, or under the influence of appropriate remedies. Most commonly, after a duration of years, it occasions the supervention of other maladies of the nervous system, under which the patient sinks. It rarely happens, that death occurs in a paroxysm, and when it does, it is owing either to the resulting hyperæmia of the encephalon, or to the depressing character of the disease itself, from which the patient does not rally.

Causes.—Young persons are certainly more subject to epilepsy than the adult; and the latter are more so than the aged. It would appear, also, to be more common among females than males after the age of seven, according to some observers, (*Andral;*) but this is by no means the author's experience. It is probable, indeed, as has been suggested, (*Frank,*) that, in some of the statistical details, hysteria has been included, so as to swell the proportion of epileptic females beyond the true point.

It has been a question, whether epilepsy ought to be regarded as an hereditary disease; but we have no statistics to settle this. It is probable, that the affirmative should be admitted. *Fourteen* epileptic women had *fifty-eight* children, of which *thirty-two* died young and in convulsions. Of the *twenty-six* that survived, *fourteen* were not attacked with epilepsy, or any other of the neuroses; *seven* had various affections of this kind, but without convulsions; *two* were epileptic; *two* had simple convulsions; and one was hysterical. (*Boucher.*)

Climate, too, seems to constitute an occasional cause. This we should expect: atmospheric heat develops all diseases that are attended with great mobility and irritability of the nervous system; and, accordingly, recruits, proceeding to warm climates and residing there, are sure to have attacks of epilepsy more frequently, or to have the disease developed, if predisposed to it.

Amongst the exciting causes have been enumerated the follow-

ing:—excessive mental application or emotion, especially frights; tickling the soles of the feet, or the sides; overpowering or peculiar odours; masturbation and venereal excesses; great fatigue; long protracted watching; over-suckling; excessive pain; the presence of worms in the intestinal canal; repercussed eruptions, &c.

The agency of some of these may admit of doubt; but there is no question, that any powerful or unwonted impression may be an exciting cause of epilepsy, when a predisposition to it exists.

A recent writer (*Meyer*) has published some cases of what he terms *epidemic epilepsy* occurring in schools. In consequence of a single girl being attacked with epilepsy, numerous others became affected; most of the girls, it appears, were approaching the age of puberty, and they were all of a highly excitable temperament. It is probable, indeed, that these were cases of hysteria rather than of epilepsy. Many cases, however, are recorded, in which the disease appears to have been produced by the sympathy of imitation by witnessing a paroxysm in another.

The idea has long existed, that the paroxysms of epilepsy may be connected with the condition of the moon; but there is no reason whatever for this belief. (*Esquirol*.)

The following table of the attacks of a young gentleman, who had been for years subject to epilepsy, was furnished by the father—himself a respectable medical practitioner of Pennsylvania—on consulting the author in the case of his son:—

1837	Jan. 1	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31								
1838	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1839	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1840	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1841	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1842	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1843	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1844	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1845	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1846	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1847	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1848	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1849	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1850	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1851	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1852	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1853	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1854	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1855	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1856	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1857	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1858	Jan. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1859	Jan. 1	2	3	4	5	6	7	8	9	10																					

1839. Months.	Days of the week.	Age of the moon.	Symptoms of alarm, but not followed by convulsions.	Convulsions.	Period between convulsions.
Feb. 16th	Saturday	4th day		Convulsion.	
23d	do.	11th do.		do.	7 days.
April 27th	do.	12th do.		do.	63 do.
May 3d	Friday	19th do.		do.	6 do.
28th	Tuesday	14th do.		do.	25 do.
June 19th	Wednesday	8th do.		do.	22 do.
24th	Monday	13th do.		do.	5 do.
July 17th	Wednesday	6th do.		do.	23 do.
25th	Thursday	14th do.		do.	8 do.
Aug. 22d	do.	12th do.	Alarm.		
28th	Wednesday	18th do.	do.		
Sept. 21st	Saturday	13th do.	do.		
Oct. 2d	Wednesday	24th do.	do.		
18th	Friday	18th do.		do.	85 do.
Nov. 1st	do.	24th do.		do.	14 do.
22d	do.	16th do.		do.	21 do.
Dec. 14th	Saturday	8th do.		do.	22 do.
20th	Friday	14th do.	do.		
28th	Saturday	22d do.		do.	14 do.
1840.					
Jan. 27th	Monday	22d do.	do.		
Feb. 21st	Friday	18th do.		do.	51 do.
29th	Saturday	25th do.		do.	8 do.
April 9th	Thursday	7th do.		do.	40 do.
15th	Wednesday	13th do.		do.	6 do.
May 1st	Friday	1st do.		do.	16 do.
23d	Saturday	21st do.		do.	22 do.
29th	Friday	27th do.		do.	6 do.
June 17th	Wednesday	17th do.		do.	19 do.
July 2d	Thursday	3d do.		do.	15 do.
10th	Friday	11th do.	do.		
18th	Saturday	19th do.		do.	16 do.
24th	Friday	25th do.	do.		
Aug. 7th	do.	7th do.		do.	14 do.
			8	25	

It would appear, that in this case, 8 paroxysms happened in the first quarter of the moon; 10 in the second; 8 in the third; and 7 in the fourth.

In regard to the days of the week, 2 attacks happened on Monday; 1 on Tuesday; 6 on Wednesday; 4 on Thursday; 11 on Friday; 9 on Saturday; and none on Sunday. In consequence of the paroxysms having occurred most frequently on Friday and Saturday, these days were most dreaded by the patient, and this circumstance had probably great effect in reproducing them.

The attacks, in this case, were almost universally in the afternoon, and never in the night, which—as already seen—is by no means the general rule.

Perhaps disorders of the digestive canal are the most common exciting causes, and accordingly we often find the paroxysms recur as certainly as aliment, improper in character or quantity, has been received into the stomach. In such case, the disease is *eccentric epilepsy*. (*M. Hall*.)

The same writer, as before observed, considers all convulsive

diseases to be affections of the true spinal marrow; and ranks epilepsy, also, among the centric convulsions, which may be induced by any disease within the spine, whether effusion, tumour, or exostosis, &c. Diseases, too, within the cranium, "by irritating the excitor nerves or the medulla oblongata, induce convulsions or epilepsy, —too frequently, alas! of an incurable character." The same may be said of disease within the spinal canal itself. (*M. Hall.*)

Pathological characters.—There are no anatomical characters, which can be regarded as peculiar to epilepsy. Such is the expressed view of some of the best pathologists. (*Foville, Andral, Dubois d'Amiens.*)

Recent writers, indeed, (*MM Bouchet and Cazauvielh,*) whilst they accord with *MM. Foville and Delage* in their opinion, that mania consists in acute or chronic inflammation of the cortical substance of the brain, are of opinion, that epilepsy consists in chronic inflammation of the medullary substance.

There must, doubtless, be some modification of structure in the brain of an epileptic, which has given occasion to the disease, and to death, and yet that modification may be altogether inappreciable. Many morbid appearances are met with in the brains of epileptics, but not one that has not been observed in other encephalic or spinal affections:—the encephalon has been found softened or indurated, or signs of hyperæmia, or of encephalic hemorrhage, or of encephalitis, have been apparent; but none of these belong to epilepsy, or distinguish it from other diseases.

If the patient dies, therefore, during a paroxysm, or soon after, these appearances may be present; if, during the interval, the encephalon may appear to be in all respects normal, or there may be a tumour, or an exostosis, which, after all, have been occasional causes only, and throw no light on the pathology of the disease.

A late writer, (*J. H. Bennet,*) affirms, that he saw, in the possession of *Magendie*, a preparation of a brain taken from an epileptic, whose intelligence was perfect during the intervals between the paroxysms, although two tumours, growing from the dura mater, had considerably pressed upon both anterior cerebral lobes. One, on the left side, was the size of a walnut, and had hollowed out for itself a portion of the nervous mass; whilst the other, on the right side, was much larger, and intimately connected with the substance of the brain, so that its exact extent could not be ascertained.

Treatment.—As the attacks of epilepsy are rarely preceded by prodromic signs that are unequivocal, opportunity does not frequently exist to prevent a paroxysm. If, however, warning should be afforded, it may be advisable to endeavour to make a new nervous impression, so as to disturb the morbid catenation.

If food, improper by quality or character has been taken, one of the direct emetics,¹ which operate speedily, may be administered; or a full dose of an opiate² may be given, to induce a new impres-

sion on the nervous system; and if the aura epileptica exist, a ligature may be applied between it and the upper portion of the limb, for the like reason.

¹ R.—Zinci sulphat. ʒss.
Aquæ cinnam. ʒxj.
Syrup. ʒj.—M. et f. haustus
emeticus.

² R.—Tinct. opii, gtt. lx.
Syrup. papav. ʒj.
Aquæ, ʒxj.—M. et fiat haustus
anodynus.

Boerhaave is asserted to have prevented a paroxysm, by taking a red hot poker, at the moment of the expected attack, and threatening to push it down the throat of the patient if he should have a fit.

Compression of the carotids, has likewise been found serviceable, not only in the way of prevention, but during the paroxysm. (*Parry, Blaud, Earle, Trousseau, Malapert, Baudelocque* neveu, *Ströhlin*.)

During the paroxysm, much cannot be done. It must have its course; and our attention must be directed to the prevention of mischief to the patient from his own convulsive movements. To obviate injury to the tongue, a cork, or a piece of wood, wrapped in cloth, may be placed between the teeth; and the head may be kept somewhat raised to prevent hyperæmia of the encephalon as far as practicable. This is all that is necessary, unless the signs of hyperæmia of the encephalon or lungs should be marked, when blood-letting may be indicated; but this is not easily practised, and is, indeed, scarcely ever needed, until the convulsions have ceased, and a deep comatose condition has supervened; and even then, an interesting question arises, which has been previously discussed, whether the coma may not be allied to a condition the very opposite to that for which blood-letting is, at times, indicated. A modern writer, (*Dubois d'Amiens*), refers to the case of an epileptic, treated by M. Andral, who died of coma, and in the ventricles of whose brain there were found ten or twelve ounces of serum; but even this does not show incontestably, that hyperæmia existed, which might have demanded blood-letting; for it has been seen elsewhere that when animals are bled to death, effusion of serum into the ventricles may be expected.

The treatment between the attacks—as in all paroxysmal diseases—is the most important; and must, of course, vary materially, according to the causes that induced it, if these can be at all appreciated.

Of old, the most disgusting agents, capable of exciting a disagreeable impression on the imagination, or on the gustatory nerves, or both, were much employed; and, in modern times, the various antispasmodics, whose effects are exerted in this manner, have been largely administered; but, at the present day—when all antispasmodics are esteemed to be relative agents only—there is no one in which confidence is reposed as regards its adaptation to every case and character of epilepsy. Ambergrise, assafœtida, castor, musk, amber, turpentine, and valerian, were once much used, but now they are scarcely ever prescribed.

Revellents,—as blisters, setons, moxas, the actual cautery, and ammoniated lotions,—have been used; and, occasionally, no doubt, with benefit; but the actual cautery applied to the vertex, as it has been recommended by some, has produced—it is asserted—unfortunate results, and, consequently, it ought to be employed with caution. The object being to excite a new nervous impression, and to divert the nervous action from the encephalon towards the surface,—perhaps the intermittent revulsion, caused by successive blisters to the nape of the neck, may be capable of producing all the effects of the articles belonging to the class of revellents. At times, a seton is inserted in the nape of the neck with the same view; and the only objection to it is, that the organism becomes accustomed to its presence, so that its effects are lost or impaired.

Still, the cases are numerous, in which the seton, as well as other forms of irritation, has appeared to exert great effect in postponing the paroxysms. In the one, of which a table was given, exhibiting the periods of the returns of the paroxysms in connection with the phases of the moon, the longest period of immunity—85 days—comprised the time the patient wore a seton in his neck. In a case, too, in which the author was recently consulted, along with Professor Chapman, by Dr. Wootton, of Lunenburg, Virginia, the patient, who had suffered from repeated attacks of epilepsy, had almost an entire suspension of the disease, whilst an accidental ulcer continued open upon his leg.

A recent writer, (*Fiévée*), has published some cases of epilepsy, that were cured by severe cauterizations, made with the caustic potassa on each side the cervical and dorsal vertebræ,—fresh cauterizations being made every five or six weeks.

Cold or tepid bathing is generally of service, and, by the reaction it induces, tends to produce an equable excitement in the nervous system, which, in the generality of cases, is the object to be had in view; and hence the utility of agents belonging to the class of tonics, and the caution with which powerful antiphlogistics should be used.

The general pathology of epilepsy would, indeed, sufficiently suggest, that the lancet should not be had recourse to, unless with much circumspection.

Of the tonics, that have been extolled, of late years more especially, in the treatment of epilepsy, we may enumerate, as more especially worthy of a few remarks, the nitrate of silver, the preparations of copper, iron, and zinc, indigo, and mugwort.

The nitrate of silver is one of the tonics that has, in the hands of some practitioners, been attended with the greatest success in epilepsy, and such has been the case in the author's own experience. It is not probable, that it ever enters the circulation as nitrate of silver, in the small doses in which it is administered. When this salt comes in contact with hydrochloric acid, which is always present in the stomach when any substance is there, it is decomposed, and the chloride of silver is immediately formed.

In this state, the silver probably enters the circulation; and, in long protracted cases, is deposited in the corpus papillare, where it undergoes, on exposure to light, the change of colour which gives a slaty hue to the complexion to some of those who have long employed it. This hue sometimes persists through life, and is a great objection to the use of the nitrate.

The nitrate of silver is said to have produced chronic gastritis, corrosion, and even perforation of the stomach; but although the author has administered it, and seen it administered largely, he has never witnessed these results. In one case, in which the paroxysms appeared to have been postponed under its employment, chronic enteritis occurred, but there was not sufficient reason to believe that it was induced by the nitrate. In other cases, indeed, constipation has accompanied its use.

By some practitioners, it has been commenced with in the dose of one-sixteenth of a grain, twice a day, and this has been gradually augmented until twenty grains in the day have been taken. The practice with the author is to commence with half a grain twice a day,¹ increasing the dose every fortnight by half a grain in the twenty-four hours.

¹ R.—Argenti nitrat. ℥ss.

Ext. gentian. ʒj.

Fiat massa in pilulas xx dividenda.

After it has been continued for about six weeks, it may be advisable to substitute, for three or four days, one of the mineral tonics, prescribed below, and then to resume it; but the patient should be firmly impressed with the belief, that no advantage is to be derived, unless this—as well as every remedy employed in epilepsy—be persevered in for a long time.

The preparations of copper, iron and zinc, have been administered by some physicians in preference to the nitrate of silver. The cupri acetat, cupri sulphat, and cuprum ammoniatum, have all been prescribed,¹ but the last seems to have been most extensively used.

¹ R.—Cupri acetat. gr. v., seu

Cupri sulphat. gr. v., seu

Cupri. ammoniat. gr. v.

Ext. gentian. ʒj. fiat massa in pilulas xx, dividenda.

Dose, one, three times a day.

The dose of each may be gradually increased, as in the case of the nitrate of silver, watching the effects upon the digestive organs.

All the preparations of iron have been recommended, and their agency is identical; but the ferrum ammoniatum and the ferri cyanuretum are more employed at the present day than any of the others. The first of these preparations may be given in the dose of three grains, gradually increased to fifteen or twenty in the course of the day.¹

¹ R.—Ferri ammon. ʒj.

Ext. gentian. ʒij. fiat massa in pilulas xx. dividenda.

Dose, one or two, and, in time, five or six.

The cyanuret or cyanide of iron or Prussian blue¹ has been recommended, and in very obstinate cases, not dependent upon organic mischief, is said to have succeeded entirely. (*Kirckhoff, Hildenbrand, Gergères.*)

¹ R.—Ferri cyanur. gr. iij.—xxxvj.

Sacchar. alb. ℥ij. misce et divide in pulveres vi.

Dose, one, two or three times a day.

The various preparations of zinc, but especially the oxide¹ and the ferro-hydrocyanate,² have likewise been given; and many testimonials have been adduced in favour of their beneficial agency.

¹ R.—Zinci oxyd.

Ext. gentian. āā. ℥ij. Divide
in pilulas xx.

Dose, one to three and more, twice a day.

² R.—Zinci cyanur., seu

Z. Ferro-hydrocyan. gr. xv.

Succ. glycyrrhis. ℥ij. Fiant

pilulæ lx.

Dose, one, morning, noon and night,
gradually increasing the quantity.

A very recent writer, (*B. Babington*), gives the preference to the sulphate of zinc, and he prefers it, on the whole, to the nitrate of silver; for although it may not be quite so efficacious, it is free from the objections to which the nitrate is subject. In some cases, he has given as much as thirty-six grains three times a day, but such large doses are not often necessary. Dr. Babington has found, that this quantity was taken equally as well in solution as in pills,—care being had to increase the dose gradually, as in the case of the tartarized antimony.

Within the last few years, indigo has been administered successfully by many practitioners, especially in Germany. (*Von Stahly, Roth, Ideler, &c.* See the author's *New Remedies*, 4th edit. 289: Philad. 1841.) Observers, however, have not agreed as to its virtues. In the Philadelphia Hospital, the author was very desirous of testing its efficacy, and trials were made by two of the resident physicians, (*Hardy*, and *McKee*), on its antiparoxysmal powers. Two of seven cases, reported by the former gentleman, were apparently cured, two ameliorated, and three without any decisive results. In these cases, the indigo was begun with in the dose of ℥j. which was usually doubled daily until the patient took ℥ij½, in the day, which quantity was persevered in for some weeks.

R.—Indig. in pulver. subtilissim. redact. ℥ss.

Pulv. aromat. gr. v. f. pulvis.

Or,

R.—Indig. pulv. aquæ guttis nonnullis subact. ℥ss.

Pulv. aromat. ℥ss.

Syrup. simpl. ℥j. Misce et fiat electuarium.

In some of the cases, the fæces, urine and perspiration, were all coloured blue.

In other trials, however, instituted by Dr. McKee and others, (*New Remedies*, edit. cit. p. 292,) the results were not as favourable.

The artemisia vulgaris or mugwort was brought forward as an antiepileptic in Germany, (*Burdach*), given about half an hour

before the paroxysm, in the dose of a heaped up teaspoonful (from 50 to 70 grains), in warm beer,—the patient being put to bed immediately, covered up warm, and allowed warm small beer to drink, so as to favour diaphoresis. The German journals contain numerous cases of its beneficial employment, and, where there is no organic disease of the encephalon, substances, which, like the artemisia, are tonic,—and the remark applies to the therapeutical agents last mentioned,—may be productive of advantage. The following form of preparation has also been suggested.

R.—Rad. artemis. vulgar. concis. ℥j.

Coque cum aq. fontan. q. s. per semi-horam ad colat. [℥j.

Dose, half a cupful, every two hours.

It is obvious, however, that a wide difference must exist among cases of epilepsy, and that where the organic modifications are considerable, as indicated by concomitant mania or idiocy, little can be expected from any remedy; but even in such hopeless cases, the number of paroxysms appears to have diminished under the use of the tonics described. Where the cerebral affection is slight, and more functional than organic, the indigo, the artemisia and the other remedies extolled in epilepsy may be useful. Their main efficacy consists, perhaps, in the new impression which they make, in appropriate doses, upon the nerves of the stomach, and through them on the whole system; but to effect the revulsion to the proper extent, it is necessary, that the dose should be augmented day by day, and the remedy be continued in large doses for a sufficient length of time.

The efficacy of tonics is dependent on the new impression made by them upon the nervous system; and, with similar views, narcotics have been largely administered. They may succeed in postponing the paroxysms when they occur frequently, but when the intervals are very long, it is difficult to draw any satisfactory inferences in regard to their, or indeed any other, agency. The object is to administer the opium, belladonna, or stramonium, nux vomica or strychnia, until a decided effect is induced,—in the case of the three first, until signs of incipient narcosis supervene, and of the last, until they begin to exhibit their peculiar effects upon the system.

Recently, it has been affirmed, (*E. Sharkey*), that in the treatment of idiopathic and uncomplicated forms of epilepsy, digitalis has had as much success, in proportion to the number of trials made, as the nitrate of silver. Dr. Sharkey's views—both pathological and therapeutical—are, however, too vague and unsatisfactory to enable us to feel confident in the results of his experience. The efficacy of the digitalis, he thinks, probably depends on a specific power! The remedy had been used by others, and it is said with success. (*Withering, Currie, Mills*.)

It need scarcely be remarked, that whenever—under the administration of any of the agents mentioned—signs of vascular excitement or hyperæmia supervene, these must be removed by

the appropriate antiphlogistic treatment, and then the former course be resumed.

Throughout the whole of the interval, the regimen should be unirritating; the diet consist of articles easy of digestion,—animal food, in preference to the succulent vegetable; and the patient should carefully avoid any aliment, that he has found to disagree with him. Should signs of gastric disorder arise; an emetic or cathartic, or both, may be administered; for frequently the exciting cause of a paroxysm lies in errors of diet. Exercise in the open air, short of inducing fatigue; and the cold, tepid, or shower bath—provided they do not cause too great a shock to the system—should also be advised; and, in short, every agency should be employed which can give tone to the nervous system.

Where epilepsy has been caused by an external injury of the head, the operation of trephining has been practised. Two cases were treated in London successfully in this manner, many years ago, (*Cline*;) three were published in this country, (*Professor Dudley*, of Lexington, Ky.); and two others have been reported more recently. (*Renzi*, *Busse*.) The results, in all, were most happy. The operation is, however, one of a serious character, and ought not to be had recourse to, unless there is every prospect, that the cause of the disease is seated in parts, which can be removed by the trephine.

It has even been proposed to tie the carotid arteries; and it is said that the results have been favourable, (*Boileau*, *Preston*;) and a recent writer (*J. B. A. Strömlin*) affirms, that Professor Trousseau, of Paris, is so convinced of the efficacy of this mode of treatment, that he has several times heard him say, if either he or one of his children were subject to epilepsy, he would not hesitate to have the carotid tied on the side opposite to the one that was most convulsed. It need scarcely be said, however, that the practitioner should hesitate long before he adopts this *heroic* remedy.

VIII. CHOREA.

SYNON. Synclonus chorea, Chorea Sancti Viti, Ch. Sancti Modesti, Choreomania, Saltus Viti, Orchestromania, Ballismus, Epilepsia saltatoria, Morbus saltatorius, Scelotyrbe tarantismus; *Fr.* Chorée, Danse de Saint-Guy, Danse de Saint-Wit, D. de Saint-Whitt; *Ger.* Veitstanz, Tanzkrankheit.

This singular disease—unquestionably seated in the nervous system—has received various appellations, and given rise to much speculation as to its nature.

Diagnosis.—Chorea is characterized by irregular and uncontrollable movements of portions of the body, or of the whole of it, rarely the latter. Sometimes, one-half the body is affected; and it has been noticed, that the left suffers more frequently than the right. (*Andral*.) In such case, it would seem probable, that the opposite hemisphere of the brain is concerned. At other times, the muscular motions are limited to certain parts—as to the face, one arm, or to separate muscles. The motions are of the most strange

and fantastic character. When limited to the face, the muscles are in constant motion, so as to induce the most singular grimaces and contortions; the articulation is also affected at times, so as to occasion stammering,—which has, indeed, been defined—“a St. Vitus’s dance of the voice;” and, occasionally, the respiratory muscles, and those concerned in deglutition, are implicated. At times, too—it is affirmed—the urine and fæces are passed involuntarily.

The senses and intellect are commonly unaffected; but when the disease persists for a long time, it is apt to render the individual fretful and capricious; and, occasionally, the intellectual faculties are impaired to such a degree as to threaten idiocy.

The nutritive functions are considered by many to be unconcerned, (*Andral*;) but there is unquestionably in this disease, as in most cerebral affections, an unusual degree of torpor in the digestive actions.

It is proper to state, that the symptoms are less marked, and frequently entirely suspended, during sleep, whilst the brain is occupied in its own acts: upon the same principle, any severe mental emotion will suspend the symptoms. A case is given by a distinguished observer, in which they were suspended during a fit of passion. (*Serres*.)

At times, the disease comes on suddenly; but, at others, there are premonitions. The patient exhibits evidences of great irritability of temper, with disordered digestive function; and, at times, palpitation, and other nervous symptoms,—twitching of the muscles of the face, arms, or legs, for example.

Its duration is extremely uncertain; sometimes not longer than a few days; at others, it continues for months and even years, and does not finally disappear, until some great evolution takes place in the organism,—as at the age of puberty.

Generally, the disease eventuates in health; but, at times, in some other of the neuroses, epilepsy especially. Fortunately, it is a good deal under remedial influence, and is not commonly very obstinate.

It is one of the affections most commonly feigned in hospitals and elsewhere, and can only be detected by careful watching, when the patient is off his guard.

Causes.—Amongst the *predisposing causes* must be reckoned age, for the disease is one of childhood. Of 32,976 children admitted into the Hôpital des Enfants, of Paris, during ten years, only 189 were affected with chorea, so that it is not very common. (*Rufz*.) A recent writer, however, (*Professor David M. Reese*, of New York,) considers, that the disease is becoming increasingly frequent; and such must be the case, if his estimate be accurate, that he has employed arsenic, in his own practice, in upwards of two hundred cases. This certainly indicates a degree of frequency, which the author’s observation can by no means confirm. The age at which it prevails most is from 6 to 14, which would negative the idea of many pathologists, that masturbation is a powerful exciting cause. (*Andral*.) Another argument is the fact, that sex affords a predis-

position,—the number of females being much greater than of males; thus, of the 189 referred to above, 138 were females, and 51 males; and this is about the proportion, according to most observers. From the cases that have been recorded by different practitioners, (*Herberden, Elliotson, Reeves, Manson,*) it has been calculated, that the proportion of females to males affected, is nearly, but not quite, 3 to 1. (*Watson.*)

In the observation of some, (*P. Frank, J. Frank,*) chorea occurs chiefly in the scrophulous and the rickety. On the other hand, it has been affirmed, that no constitutional difference is perceptible between those who are affected with chorea and others. (*Elliotson.*) The discrepancy is equally great in regard to the colour of the hair. Whilst some affirm, that the majority of subjects are light-haired, (*H. Bell,*) others (*Rufz and Dufossé*) found in 38 cases, only two with brown hair; and a more recent observer (*Watson*) remarks, that the disease occurs much more frequently in children having dark hair and eyes, than in those of a light complexion.

It would appear, also, that a predisposition may be transmitted from parent to child. (*Elliotson, Coste, Constant, H. Bell.*)

Amongst the exciting causes are enumerated—powerful mental emotions, as excessive fright or rage; masturbation; diseases of the stomach and intestines, &c. Numerous other causes have been pointed out, but they are not peculiar to this disease. It is unquestionable, that it may be developed by imitation, and hence the necessity, in boarding schools, of keeping the patient isolated, to avoid what has been called “a true nervous contagion.” (*Andral.*) It is proper, however, to remark, that a recent observer states, that in the large Hôpital des Enfants, of Paris, he never saw it produced in this manner. (*Blache.*)

Pathological characters.—As the disease rarely proves fatal, there are but few opportunities for tracing its anatomical characters; and the opportunities that have been embraced have thrown no positive light on the seat or nature of the affection. By some, it has been conceived to be placed both in the brain and spinal marrow; and it has been referred to the latter mainly under the idea that all convulsive affections have their location there, (*Frank:*) by others, it has been regarded as a morbid condition of the tubercula quadrigemina, (*Serres:*) by others, again, the medulla oblongata has been found diseased; and, lastly, the majority of observers have not been able to satisfy themselves, that there was either in the encephalon or medulla spinalis any morbid appearances which could throw the slightest light on the pathology of the disease.

In the case of a girl, nine or ten years of age, who died purely of the disease,—that is, worn out by the excessive and continued movement, no lesion whatever could be detected in the brain or spinal marrow, although these organs were examined with the most scrupulous attention. (*Gerhard, of Philadelphia.*)

It is evidently a functional affection of the nervous centres, in

the large majority of cases, but of what precise nature we know not, except that, generally, signs of great nervous mobility and debility are present, and have to be energetically combated.

By a recent writer, (*Laycock*), chorea is regarded as the precursor of hysteria,—in fact, as the hysteria of the female child.

Treatment.—The treatment of this disease has varied materially according to the pathological views formed of its nature. They, who have regarded it as an inflammatory affection of some portion of the encephalon, have recommended general blood-letting, or cupping, or leeches to the upper part of the neck, and over the occiput, (*Serres*), with revellents—in the form of epispastics, over the same region. Under similar views, issues and frictions have been established along the spine.

There can be no doubt, that cases of chorea present themselves, accompanied by symptoms that demand, or appear to demand, the use of depletives; but the nature of the disease is, we think, any thing but inflammatory; and, therefore, when any of this class of remedies—and *à fortiori* the more powerful—are employed, care must be taken not to add to the existing impressibility of the nervous system by pushing them too far: for these reasons, local blood-letting is to be preferred to general.

The use of cathartics was at one time highly extolled, (*Hamilton*, Senr., of Edinburgh;) and there is no doubt, that good effects are to be obtained from them. It has been remarked, that torpor of the intestinal tube is a common concomitant; and it is obvious, that accumulation of fæcal matter in the intestines,—which, at times, takes place to an extraordinary amount,—must react injuriously on the nervous system already inordinately impressible. Cathartics are, consequently, valuable therapeutical agents; and, moreover, they act most beneficially as revellents, by concentrating the vital actions towards a part of the nervous system less concerned in the malady. Cathartics, besides, administered occasionally so as to act briskly on the alimentary canal, instead of being debilitants, add tone to the system by the new excitement which they induce. It is only when pushed too far, that they exhaust by irritation, and are, therefore, improper in chorea, as well as in all the neuroses.

R.—Ol. tigllii, gtt. j.
Micæ panis, q. s. ut fiant
pilulæ iij.
Dose, one, occasionally.

R.—Pulv. jalapæ, seu
Pulv. rhei, gr. vj.—x.
Hydrarg. chlorid. mit. gr. ij.
Pulv. zingib. gr. iij.—M.
For one dose.

Along with purgatives, it has been proposed to associate the use of tartarized antimony in large doses, but given carefully so as to avoid the induction of vomiting; and cases of the efficacy of this mode of treatment have been published. (*Breschet*.)

All the reputed antispasmodics—assafœtida, valerian, &c., and the various narcotics, have been used, and highly extolled by some practitioners; and doubtless, at times, the results have been favourable.

It is, however, to the combination of tonics with cathartics, that we have to look for the most advantageous agency. Of the tonics, those belonging to the mineral kingdom have been preferred, as in the other neuroses.

The oxide of zinc, the cuprum ammoniatum, and the nitrate of silver, have been prescribed with great success by many practitioners, in the forms and doses described under Epilepsy, (p. 302, of this volume,) and, of late more especially, the precipitated carbonate or sesquioxide of iron has been brought forward with high pretensions. A recent writer (*Elliotson*) affirms, that he has had—he should suppose—forty cases in succession, all cured by it; but perseverance in its use is demanded,—the affection generally disappearing when the remedy has been given about six weeks or two months: in some obstinate cases, however, it has been necessary to continue it for twelve weeks. It is generally easily taken by children in molasses; and, in the case of those under and near the age of puberty, it may be commenced in the dose of ten grains twice a day; increasing the dose weekly by five grains. Should it disagree with the stomach, a little aromatic powder may be added to it.

R.—Ferri carb. præcip. gr. x.

Pulv. cinnam. comp. gr. v.—M. et fiat pulvis.

To be taken twice a day in molasses.

Arsenic, in the form of the liquor arsenitis potassæ or Fowler's solution, has been given with benefit, (*Salter, Heming, M. Hall*,) and a writer already cited, (*Professor Reese*, of New York,) affirms, that after very considerable opportunities, he has learned to rely upon the tonic powers of arsenic in preference to any, and all other, medicines of this class, and “has never known it to fail in effecting a radical and permanent cure.” In the most numerous subjects, varying from seven to sixteen years of age, he prescribes 6 or 8 drops of the liquor arsenitis potassæ, night and morning, gradually increasing the dose and the frequency. Should the ordinary symptoms of over-dose of the arsenic appear, he discontinues the medicine for a few days, and then resumes it in a diminished dose. Whatever tonic is employed, its use must be persevered in for weeks, and the dose be gradually augmented.

The plan, pursued by the author, and which he has found entirely satisfactory, has been—to administer a brisk cathartic twice a week, where the powers of the system would admit of it; and, at the same time, to give regularly and freely one of the tonics above mentioned. The ferri carbonas precipitatus and the arsenious acid have answered every purpose, and, consequently, he has adhered to them, but any of the other mineral tonics may be substituted.

The cyanuret of iron has also been administered with success in chorea;—three grains being given in the form of pill three times a day.

R.—Ferri cyanuret, gr. ix.

Ext. gentian, gr. xv.

M. et divide in pilulas vj.

Dose, two, three times a day.

In one case, the girl, twelve years old, was entirely cured in six days, after camphor, opium, quinia, assafœtida, nitrate of silver, and carbonate of iron, had been given in vain. (*Zollickoffer*, of Maryland.)

Of late, the cyanuret of zinc has been brought forward by the physicians of the Berlin Polyclinic Institute. It was begun with in the dose of one-third of a grain twice a day, and was gradually raised to fourteen grains in the 24 hours: its efficacy has been confirmed by other observers, (*Müller, Günther*.)

Iodine has likewise been given, and it is said with advantage, (*Gibney, Bardsley*), as well as strychnia, (*Romberg*), and veratria, (*Ebers*); but these remedies possess no advantage over those referred to above—whilst the cases, treated by them, have been few, and their remedial agency by no means clear or definite.

The oleum terebinthinæ has been found a valuable medicine in chorea; whether produced by worms or not. When the bowels are torpid, and the girl is of that age in which the first occurrence of menstruation may be looked for, its arrival has seemed to have been accelerated, and great relief produced, by the turpentine. (*Watson*.) It may be given alone, or associated with the oleum ricini.

R.—Ol. terebinth.

— ricini, āā ʒij.

Mucilag. acaciæ, ʒj.

Aquæ menthæ, ʒivss.—M.

Dose, a fourth part, night and morning.

Of late years, testimony has been adduced in favour of the cimicifuga, which—in large doses—is an acro-narcotic poison. According to many observers, it has been productive of the most beneficial results. (*Jesse Young*, of Maryland; *Professors Physick* and *Wood*, and *T. S. Kirkbride*, of Philadelphia; *Beadle* of New York.) Dr. Kirkbride always administers cathartics before he has recourse to it; and he considers general frictions with salt or the flesh-brush, and pustulation with croton oil over the spine, of much value in the chronic cases.

Happy effects were likewise derived from the cimicifuga in a case of convulsions, occurring periodically, and connected with uterine disorder. (*Professor Wood*.) A teaspoonful of the powdered root may be given three times a day; or the following decoction.

R.—Rad cimicifug. cont. ʒj.

Aquæ, Oj.

Boil for a short time and strain.

Dose, two to four table-spoonfuls, three or more times a day.

Along with the internal remedies, which have been recommended, the cold bath may be used, especially in the form of the *douche*. The new nervous impression made by it is so salutary,

that it has been thought by an able observer, that no case of chorea could withstand it. (*Dupuytren.*)

Where too great a shock is produced by the cold douche, the tepid or the warm may be substituted; or simple cold or tepid bathing may be recommended.

Great success appears to have followed the use of sulphurous baths. In the course of five years, one practitioner (*Baudelocque*) treated 27 cases by them, 25 of which were cured.

Recently, electricity has been extensively and beneficially employed in chorea. (*Addison, G. Bird.*) Of thirty-six cases, in which it was used by Dr. Bird, twenty-nine are said to have been cured, and five relieved; one experienced no relief, and one left under alarm at the remedy. In the majority of cases, the only medicines prescribed along with it were occasional mild cathartics, which—as well as other agents—had been previously given without advantage. The electricity was applied, in the form of sparks taken in the course of the spinal column every other day, for about five minutes each time, or until a papular eruption appeared, which is often excited by the remedy in this form. No good result was ever found from the transmission of electric shocks along the affected limbs; on the contrary, in every instance, the involuntary movements were increased, often to an alarming extent; and if employed when the patient was convalescent, it invariably aggravated every symptom, and frequently rendered the disease as severe as when the patient was first placed under treatment. (*G. Bird.*)

It would appear, from some observations recently published, (*G. Southam*), that confining the affected limb in splints has had a beneficial agency, by directing the patient's attention to the deranged muscles.

Properly adapted gymnastic exercises are likewise valuable adjuvants: they engage the attention, and strengthen the action of the nervous system, and are, in every way, advantageous.

The diet—it need scarcely be said—should be plain and digestible; but where tonics are demanded, it obviously need not be greatly restricted as to quantity. It may consist of food that is nutritious; but all excitement both mental and corporeal should be carefully avoided.

Where chorea is complicated—as it occasionally is—with disease of the heart or pericardium, or of the spinal cord, or its membranes, the treatment will have to be modified according to the character of the complication.

A recent writer (*Watson*) has drawn attention to a class of convulsive spasmodic affections, which, he considers, resemble epilepsy on the one hand, and chorea on the other, or rather form a link of alliance between the two, and which are especially remarkable, owing to their being propagated by the sympathy of imitation. Of this we have examples in the *convulsionnaires* of all times; and in certain religious sects, which exist in this and other

countries. Their history is curious as exhibiting the singular influence of the *moral* on the *physique*, but is of no interest to the therapist.

Not long ago, the author was consulted by a young medical friend in regard to the nature of a singular convulsive affection, which, he affirmed, prevailed in a part of the country with which he was familiar. The author has not seen any case of it; and he therefore gives the history, as it was kindly furnished him by Dr. Waters.

“FRANKLIN, *N. York*, 5th May, 1841.

Prof. R. DUNGLISON.

Dear Sir:—In obedience to your kind request I improve my first leisure since my return home, in giving you, in as lucid and satisfactory a manner as possible, an account of a singular affection somewhat common in the south-eastern portion of this state, and known among the common people as “*the magrums*.” Whence the name originated I know not, but if it be a corruption of the word “*megrim*,” I am at a loss to understand how it ever came to be applied by the vulgar to the disease of which I am speaking, and which has nothing in it analogous to ordinary hemicrania or megrim. It consists essentially in a spasmodic action of all, or nearly all, the voluntary muscles of the system—of involuntary and more or less irregular motions of the extremities, face and trunk. In these involuntary movements the upper part of the air passages occasionally participate, as is witnessed by the ‘*clucking*’ sound in the neighbourhood of the glottis, and in a manifest impediment to the powers of speech. The expression of countenance, and general appearance of the patient, are very much such as are described as characteristic of chorea.

The disease is markedly hereditary, and is most common among the lower classes, though cases of it are not unfrequently found among those, who by industry and temperance have raised themselves to a respectable rank in society. These involuntary movements of the face, neck, extremities and body, cease entirely during sleep.

This singular disease rarely—very rarely indeed—makes its appearance before adult life; and attacks after forty-five years of age are also very rare. When once it has appeared, however, it clings to its suffering victim with unrelenting tenacity till death comes to his relief. It very rarely or never ceases while life lasts.

The first indications of its approach are spasmodic twitchings of the extremities—generally of the fingers—which gradually extend and involve all the voluntary muscles. This derangement of muscular action is by no means uniform; in some it exists to a greater, in others to a less extent, but in all cases it gradually induces a state of more or less perfect dementia.

This disease, in its origin and progress, is not, as far as I have been able to discover, attended with any unusual pain in the head. In some of the worst cases I ever saw, I could not discover, that there had ever been any unusual sensation in the cerebral region.

When speaking of the manifestly hereditary nature of the disease, I should perhaps have remarked, that I have never known a case of it to occur in a patient, one or both of whose ancestors were not, within the third generation at farthest, the subjects of this distressing malady.

The appetite is commonly good, and the process of digestion seems generally to proceed with considerable regularity. The bowels are however usually somewhat costive, though I have known cases in which daily evacuations were not unfrequent. Of the general appearance of these evacuations I am not informed.

The pulse does not deviate materially from the healthy standard, and consequently presents nothing remarkable.

It may not be amiss to state, that the last patient who came under my observation, and who had the reputation of being an honest man, informed me, that, in his own case, this involuntary action of the muscles ceased under the influence of all instrumental music, *except that of the common 'Jew's-Harp.'* I very much regret it was not in my power to test the truth of this statement.

I also regret, that it is not now in my power to give any information as to the condition of the catamenia in those labouring under it. I hope to be able to institute a course of inquiry upon this subject during the ensuing summer or fall. The disease is markedly hereditary.

I have thus, dear sir, given you a general—though perhaps not very lucid and satisfactory—account of this singular malady. I may observe that, although the descriptions of chorea in the books apply very well to this disease, it nevertheless seems to differ in several respects from ordinary chorea. 1st. It rarely occurs before adult age. 2d. It never ceases spontaneously. 3d. When fully developed it wants the paroxysmal character.

After all, may not this disease be a peculiar modification of chorea?—is not its pathology in the main the same, and would it not probably be found to yield to the treatment most suited to chorea, if to any?

I am, dear sir, respectfully,

Your ob't serv't,

C. O. WATERS."

Under the head of *Chronic chorea*, a recent writer, (*Watson*), has placed those *partial choreas*, *Tics*, *Spasmodic tics*, *Nervous tics*; *Fr. Tics nerveux*; commonly seen in nervous persons, which consist in the most irregular and fantastic movements of certain muscles,—at first, perhaps, the result of bad habits, but which are subsequently executed independently of all volition. Thus, children occasionally get into the habit of rapidly winking both eyes, or of moving the nose, or angles of the mouth; and, after a while, the parts are so much accustomed to the action, that they may remain permanently, and be the source of great annoyance in after life. Some of the greatest ornaments of their race, have been disfigured by these awkward habits or tricks contracted in early life. In other cases, however, they arise in consequence of some morbid condition of the nerves, and in spite of every effort on the part of the individual. "I am acquainted," says the writer just cited, (*Watson*), "with one gentleman, who is perpetually wrinkling his nose; and he has assured me, that he was subject, when young, to an involuntary shake of the head; but a blister having been once applied to the throat for some disorder in his air passages, the shaking of the head was thereby rendered painful and difficult, and the movement there ceased; but, (as he expressed it,) it broke out in his nose, where it triumphs to this day."

There is no system of medication, which is productive of any advantage in those cases. If mental attention and revulsion are unable to rectify the evil, no therapeutical agent will be of any avail. The affection is, however, totally devoid of danger.

IX. TREMOR.

SYNON. Synclonus tremor, Tromus, Trepidatio; *Fr.* Tremblement; *Ger.* Zittern.

This affection often bears considerable similarity to chorea; it

consists in slight involuntary contractions of the voluntary muscles, or of part of them; the convulsive movements not interfering with the movements regulated by volition, except by deranging or embarrassing them, or by rendering them uncertain. The upper parts of the body are more frequently affected than the lower, owing, perhaps, to the support afforded to the latter by surrounding bodies, whilst the upper extremities and the head owe their steadiness altogether to the contraction of the appropriate muscles. (*Dubois d'Amiens.*)

The precise nature of the disease of the nervous system is unknown; but it would appear to be dependent upon a badly regulated or intermittent supply of the nervous agency, to which the term "locomotive influx" has been given by some physiologists. (*Magendie.*)

As the symptoms vary somewhat according to the cause, it may be well, in the first place, to refer to the

Causes.—Any violent mental agitation, as excessive anger or fear, induces a general tremor or trembling, which is more marked, perhaps, in the lower than in the upper limbs, but the tremor passes away with the cause that induced it. All profuse evacuations, and every debilitating agency, must be equally regarded amongst the causes, as well as the excitement induced by excess in the venereal act, and by the alternate stimulation and depression occasioned by too liberal indulgence in alcoholic potations. It is also observed in the course of long protracted febrile diseases, especially in those of the typhoid and typhous kinds, and in fact towards the termination of all acute and chronic diseases, in which the powers of the nervous system yield. In some cases, the convulsions are marked, giving rise to convulsive twitchings, termed *Subsultus tendinum*, or to irregular motion, as if the individual were picking the bedclothes, a state which has been termed *Carphologia*. Tremors take place, likewise, in the progress of age, hence termed *senile*; and they are observable in muscles, whose nervous energy has been worn out or impaired by continued exertion.

One form of the disease is induced by mercurial vapours, and is, hence, met with in gilders of metals, looking-glass manufacturers, makers of barometers and thermometers, &c.; and it is mentioned as remarkable, that when mercury is received into the system in this form, it does not occasion salivation; whilst if it be conveyed by friction, or through the stomach, salivation is induced but no tremors, (*Andral*;) at least, such, *Andral* observes, is a general rule; but farther observation appears to be needed before we can consider it established. At times, too, the preparations of lead have appeared to induce it.

Abuse of opium and tobacco produces the same effect as the alcoholic liquors. The nervous vacillation is perceptible under an over-dose of either, as in cases of inebriation; but in such case it is transient. Under habitual use, however, it becomes permanent.

Some of the worst cases of nervous trembling, which the author has seen, were caused by the immoderate use of tobacco; but, in all cases, the nervous system recovered its power under the gradual diminution and entire discontinuance of the cause.

Diagnosis.—The symptoms require no description. It has been already remarked, that the tremors may be general or partial. In the aged, they are commonly confined to the head; but the muscles of the upper extremities especially may participate. At times, the tremors are suspended during sleep.

In mercurial tremors, the affection is most commonly limited to the limbs; so that uncertainty in the gait, embarrassed movements, and impaired powers of prehension, are the main symptoms; and these are, occasionally, accompanied by sudden involuntary jerkings or twitchings of the muscles, and cramps.

The duration of the disease must vary. Often, it passes away with the removal of the cause; but the tremors of old age, depending as they do, on the impairment of innervation connected with the period of life, and hence being a form of *Shaking palsy*, *Paralysis agitans*; Ger. *Zitterlähmung*, may be deemed incurable.

A late writer (*Rufz*) has given a singular case of this affection, of which the following were the prominent phenomena. A boy, aged 10, was received into the *Hôpital des Enfants*, Paris, having a constant trembling of the left side, which was more marked in the upper than in the lower extremity. He could, however, walk, run, lay hold of objects, and keep them in his hand. The tremors had continued for ten years, and had come on without any adequate cause. His health, indeed, had always been good. Many physicians had treated him for chorea, and after having been subjected to varied treatment, he left the hospital, without having experienced any amendment. M. Rufz considers, that there is no analogy between this affection and chorea: but a recent author (*H. Bell*,) thinks they are strikingly similar. M. Bell gives, also, two cases of an analogous nature. One of these occurred at the *Hôpital de la Charité*, in Paris, in a man, fifty years of age, who, whenever he was desirous of remaining erect, without walking, was seized with tremors, or rather with an alternate movement of flexion and extension of the knees; and this continued as long as he remained at rest, but as soon as he began to walk, the trembling disappeared, and the limbs had all their usual power and agility. The trembling ceased, also, when he was in bed.

The second patient was a man forty years of age, healthy and vigorous, who had a strong oscillatory movement of the left arm, whenever he was desirous of holding himself still; but when he used his hand, even in the most delicate movements,—such as holding a glassful of water—the trembling ceased, and not a drop of liquid was spilled.

M. Bell considers, that these were cases rather of disorder of the muscular movements resembling chorea, than of incomplete paralysis. The true view, perhaps, is to regard them as com-

bined. The author has this day (Nov. 20, 1841,) exhibited to his class, at the Philadelphia Hospital, a case in which the distribution of the locomotive influx, under the influence of volition, is very imperfectly executed. The patient exhibits many of the phenomena of paraplegia; and when he is seated is unable to rise; but the moment he is placed upon his feet, he walks, with a gait, however, characteristic of the paraplegic.

Treatment.—In many of the cases above mentioned, the tremors cease with the removal of the cause. In others, however, it persists. The disease, in protracted cases, consisting, as has been seen, in loss of nervous power—and, probably, in the medulla spinalis, whence the motor nerves that pass to the affected muscles arise—blisters or excitant liniments¹ have been applied to the region of the spine.

¹ R.—Linim. saponis, ʒx.

Tinct. cantharid. ʒij.—M.

To be used twice a day over the spine.

Or, R.—Liq. ammon. fort. ʒss.

Spirit. rorismarin.

—— camphor. āā ʒvj.—M.

The nux vomica, or strychnia, both of which are known to exert an excitant influence on the spinal marrow, may be administered as elsewhere advised, (p. 263.) The strychnia has been strongly recommended in the shaking or trembling action of the muscles, which is produced by habitual intoxication. (*Pereira.*) In cases of tremors, induced by narcotics,—amongst which we may place alcohol in all its varieties,—when not of too long standing, good effect has resulted from new nervous impressions; and the report of MM. Andry and Thouret, commissioners of the Société Royale de Médecine, of Paris, have shown that, in this way, the magnet was beneficial. With the same view, electricity and galvanism might be employed. In cases of tremors produced by mercury, electro-puncture has been advised, (*Guersent,*) and it might unquestionably be serviceable. In these last cases, the patient must be removed from the causes that induced them. Warm bathing, vapour baths, and brisk cathartics, so as to occasion a revellent effect on the intestinal canal, with a bland, unirritating diet, have been found to constitute the most successful management. Sulphurous baths may, likewise, be recommended, as well as the use of sulphur internally, (*Lactis sulphuris*, gr. xv. ter die sumenda.)

The sulphurous baths have been found advantageous by their excitant agency in purely nervous tremors. (*Andral.*)

X. NERVOUS APOPLEXY.

SYNON. Apoplexia nervosa seu spasmodica, A. simplex; *Fr.* Apoplexie nerveuse; *Ger.* Nervöser Schlagfluss, krampfhafter Schlagfluss.

With the English and American writers, the term “Apoplexy” is appropriated to a set of morbid phenomena, characterized by loss of sensation, motion, and mental and moral manifestation. These phenomena may, however, be induced by various pathological conditions. It has already been seen, that they may be caused by effusion of blood into the encephalon; by simple hyperæmia, and

by effusion of serum,—constituting *sanguineous apoplexy*, *congestive apoplexy*, and *serous apoplexy*. There is one other form, however, which, in the existing state of knowledge, may be, perhaps, ranged under the neuroses, as it has been done by some pathologists. (*Andral*.) In this variety, no lesion whatever may be perceptible on dissection, although the patient may have died under all the phenomena that are characteristic of apoplexy. To it the term *nervous apoplexy* has been given by many, whilst, by others, it has been called *simple apoplexy*. (*Abercrombie*.)

Confusion has been introduced into medical nomenclature by the extended acceptation that has been given to the word “apoplexy.” Thus, instead of its being appropriated to affections characterized by disorder of the phenomena of sensibility and motility above mentioned, many of the French authors—and others have followed the example—have employed it synonymously with cerebral hemorrhage; and it has even been extended metaphorically to designate other hemorrhages that occur into the substance of organs; hence we speak of *pulmonary apoplexy*, *cutaneous apoplexy*, &c.

Diagnosis.—The symptoms that belong to this form of apoplexy do not differ materially from those of serous apoplexy. Generally, it would seem to be preceded by nervous symptoms,—tremors, convulsive movements, depravation of the senses of vision and audition, &c., more or less confusion, stupor, vertigo or delirium. The attack is almost always sudden, and immediately succeeding some powerful mental emotion. The ordinary symptoms are those described under Hemorrhage into the encephalon: there is total or partial loss of sensibility and motion, with stertorous breathing. Careful observation may, however, show, that along with incomplete loss of sensation, there are slight convulsive movements. The loss of power, or the paralysis, is commonly alike on both sides; or, if it appears to be greater for a time on one side, it may subsequently be more marked on the other; and almost always, there is a greater change in the symptoms than occurs when they are caused by cerebral hemorrhage, or by any form of pressure exerted on the encephalon.

Should the symptoms of apoplexy have occurred many times, have continued for only a short period, and left behind them no evidence of compression, it has been inferred that the affection is nervous apoplexy. (*Chomel*.) But this might be a very erroneous inference, inasmuch as all the functional phenomena of apoplexy—as has been shown elsewhere—may be developed under a hyperæmic condition of the vessels of the encephalon.

The duration of the disease is commonly short; often, it occurs and disappears almost instantaneously. Its termination is, indeed, generally sudden; and, in some cases, it is accompanied by a copious discharge of limpid urine, and of flatus from both extremities of the digestive tube, yawning and stretching, and other functional phenomena, which mark the decline of hysteric attacks. (*Chomel*.)

The following case, which is at present (Dec. 1841) in the author's clinique at the Philadelphia Hospital, is elucidative of this and of other neurotic cases. The patient had been for some time under the care of Dr. Pennock, the author's predecessor in the wards, and the note of the case, which afforded an interesting occasion for comments to the medical class, was furnished by Dr. Ludlow, one of the resident physicians.

C. M., aged 35, a weaver by trade, entered the hospital on the 13th of September, 1841, labouring under a slight attack of intermittent fever, and complaining likewise of pain, referred to the base of the cerebrum. After remaining in the wards for some time, the paroxysms of fever were checked, but the encephalic symptoms augmented; and he was now affected with inability to govern the motion of his limbs. At this time also, he was attacked with slight tetanoid spasms, and with loss of power over the right side. He was cupped freely over the back part of the head; blisters were applied to the nape of the neck, and mercurials were given in small doses. Under this treatment he improved, and finally recovered so far as to possess the complete use of his limbs. A tonic system of medication was prescribed, and convalescence appeared to be established. On the 18th of October, however, symptoms supervened, which appeared to threaten a second attack, or rather a relapse into his former condition. There was more marked stupor; great flushing of the cheeks; twitching of the left side of the face; inability to protrude the tongue; anxious countenance; feeble pulse, and general torpor of the whole system.

A large blister was now directed to the nape of the neck, with counter-irritants to the extremities; and mercurials were again given internally. Before, however, the blister had time to act, the patient was seized with convulsions. The face was livid; the eyes were rolled back and upwards towards the forehead; there was great twitching of the muscles of the right side, and violent tetanoid spasm of the left side, bending the body in a semi-ovoid form; the arms were perfectly rigid; the thumbs were turned inwards; the respiration was stertorous, and a bloody fluid exuded from his mouth and nostrils. The body was cold, and the pulse scarcely to be felt at the wrist. A large blister was again applied as high up on the neck as possible, and another down the whole course of the spine. Mustard pediluvia, and sinapisms to the inside of the legs and thighs were directed, and the body was rubbed with a stimulating liniment. Hot brandy toddy was given freely by the mouth, and camphor both by the mouth and rectum; the blistered surfaces were dressed with the sulphate of quinia, and mercurials were administered as before.

Under this treatment, the patient gradually improved, and no unpleasant symptoms occurred to arrest the cure. He was attacked, indeed, with slight dysentery, but this was speedily removed.

When this patient was exhibited by the author to the clinical class, (Nov. 20, 1841,) he was entirely free from all encephalo-spinal

symptoms, with the exception of a sensation of slight coldness in the arm that had been paralyzed.

Causes.—The causes of nervous apoplexy are, generally, powerful mental emotions; hence it occurs especially in hysterical and hypochondriacal persons. It is said to be more frequent in men than in women, and in the more impressible inhabitants of cities than in those of the country. (*Chomel.*)

The condition of the encephalon, in these cases, has been compared to that which exists in concussion of the brain. The pulse, instead of being slow but regular, and of unimpaired strength, is feeble, irregular, and fluttering; and a general paleness of the surface indicates a degree of failure of the circulation far beyond what is observed in cases of compression.

Powerful mental emotions may destroy instantaneously; but—as has been suggested—a long continued recurrence of slighter causes weakening the powers of the encephalon may, at the same time, gradually impair those of the heart and blood-vessels, in the same way that an infusion of tobacco applied to the brain impairs its energy. (*W. Philip.*) In like manner—it can be understood—that long protracted disease may lay the foundation for it.

Treatment.—The management of a case of nervous apoplexy must be regulated greatly by the nature of the attendant symptoms. If—as is generally, perhaps, the case—the powers are below the proper standard, great caution must be had in having recourse to depletion. The cause of the disease is generally of such a character, in these cases, as can scarcely fail to be aggravated by loss of blood. There may be cases, however, in which the application of cups, combining, as it does, capillary depletion and revulsion, may be of essential service. In all cases, it will be advisable to prescribe revellents, such as blisters to the nape of the neck and to the spine; terebinthinate injections to the rectum, and sinapised pediluvia, or sinapisms to the lower extremities. Excitants—as ether, camphor, &c.—may be given internally, but care must be taken that they are properly adapted to the case, otherwise they might be productive of much disadvantage; the external excitants are, however, liable to no objection.

After the symptoms have passed away, the influences that gave occasion to them must be sedulously avoided. Occasionally, these would seem to have supervened periodically; in such case, the sulphate of quinia may be administered with benefit. (*Chomel.*)

XI. CATALEPSY.

SYNON. Catalepsia, Catalepsis, Carus catalepsia, Catoche, Catochus, Congelatio, Prehensio, Apprehensio, Stupor vigilans; *Fr.* Catalepsie; *Ger.* Katalepsie, Starrsucht.

This affection of the nervous centres consists in a tonic contraction of some of the muscles, so that the limbs retain the position they had prior to the attack, or in which they may have been placed during it. Along with this, the intellectual faculties, and

all the functions of sensibility, are more or less completely suspended.

Diagnosis.—The symptoms of catalepsy are very complicated. As in the neuroses already described, there may be prodromic or premonitory signs, such as palpitation, yawning and stretching, cramps, and cephalalgia; but, at other times, the patient is suddenly attacked with a general or partial rigidity of the muscles, and a total, or almost total, loss of consciousness,—the limbs retaining the position they were in prior to the paroxysm; the eyes are fixed, and generally directed upwards and forwards; the respiration may remain free, unless the disease attacks the respiratory muscles, when it becomes difficult, and almost imperceptible. The same may be said of the circulation; the pulse may continue full and free; but, at times, it, also, can scarcely be perceived. Generally, the limbs continue flexible, but stiff when we attempt to move them; at other times, they are entirely rigid: commonly, no matter what may be the position in which we place them, they retain it.

With these symptoms there are, occasionally, clonic convulsions. (*Dubois d'Amiens.*)

The face is commonly flushed, and the surface warm. In rare cases, the intelligence is not disturbed; but, in the majority of instances, no recollection exists of what took place during the paroxysm. The general sensibility is lost, so that the surface may be pinched or pricked without pain being experienced; the eye is not found to contract on the approach of light; and the hearing is totally suspended.

The duration of the attack is not always the same. At times, it is transient; at others, it continues for hours and even days, and is, doubtless, one of the forms of *trance* of which we read in authors. (*Isaac Parrish*, of Philadelphia.) Cases, indeed, are on record, in which cataleptics have been considered dead, and interred alive.

Causes.—The predisposing cause is, doubtless, great impressibility of the nervous system; and hence the affection is observed in females who are subject to hysteria, of which, indeed, catalepsy can only be regarded as a variety.

In a lady, whose family are predisposed to insanity, and who is herself liable to hysteria, the author has seen well marked catalepsy developed under the action of powerful mental emotions,—which must be esteemed the ordinary exciting causes, as well as any thing that powerfully affects the nervous system, and produces irregularity in the distribution of the nervous influence. Hence, catalepsy is one of the conditions developed under the operations of the animal magnetizer. The author had under his care in the Philadelphia Hospital a female, who had recovered from delirium tremens, whose nervous system—as in all such cases—was left inordinately impressible, and who could be thrown into a state of catalepsy by the fixed look of the resident physician, even when not continued for more than two minutes. In this state, the limbs, if placed in any position, would remain immovable for a long pe-

riod, even if the bedclothes were placed upon them. In fact, she presented all the symptoms described above as appertaining to catalepsy. This case will be referred to hereafter.

Pathological characters.—As the disease is extremely rare, and, when it does occur, commonly terminates in health, no opportunities have arisen for observing the appearances of the nervous centres. Nor is it probable, that any could be detected. It is one of those neuroses, like those already described, and those to be described hereafter, that are not indicated by any visible evidences, and exhibit their functional character, by the rapidity with which they pass off, leaving the patient in health.

Treatment.—This must be the same as in hysteria, of which—it has been remarked—catalepsy can only be regarded as a variety. In the cases of catalepsy, which we now notice more frequently under the manipulations of the animal magnetizer, the disease requires no management. It continues for a shorter or a longer period, after which the patient awakes entirely restored, or affected with more or less dulness of the sensorial faculties, which gradually passes off.

A morbid condition of the nervous centres is sometimes met with, which has been regarded as a minor form of catalepsy. (*Watson.*) This is the *Ephialtes vigilantium*, *Incubus vigilantium*, *Ephialtes hypochondriaca* or *Daymare* of writers, so called in consequence of its resemblance to *Nightmare*. In this affection, the patient is incapable of moving or speaking, but is conscious of everything that transpires around him. It is rarely met with, and only, perhaps, in highly impressible persons. It appears, indeed, chiefly in hysterical females.

XII. HYSTERIA.

SYNON. Sypspasia hysteria, Malum hystericum, Passio hystERICA, Morbus hystericus, Affectio hystERICA, Hysterismus, HystERICs; *Fr.* Hystérie, Mal de mère; *Ger.* Hysterie, Mutterkrankheit, Mutterplage, Mutterbeschwerde.

This disease received the name from its supposed origin in, or connection with, the uterus, (from ὕστερα, “the uterus;”) but this notion has been long exploded, although the condition of that organ may be concerned in its causation. Many cases occur in females, in which there is no reason to presume any such connection, whilst examples of well marked hysteria are unquestionably seen in men.

Diagnosis.—Hysteria is most protean in its character. There is scarcely, indeed, an affection which it may not simulate. Still, there are a few symptoms, which may be regarded as pathognomonic. They, who are liable to it, are endowed with nervous systems which are unusually impressible, and are observed to be seized with paroxysms of laughing or crying, often in alternation, and without any manifest cause. They are subject, also, to great variety in their spirits, being unduly dejected or elevated; and, at times, to dyspeptic symptoms, accompanied by more or less hypochondriasis. These symptoms, with the sensation of a ball ascending

from the stomach to the throat, and inducing a feeling of impending suffocation—hence called *globus hystericus*; palpitation, and occasionally dyspnœa; nervous headache; constipation, and a copious secretion of limpid urine, may be regarded as amongst the minor characteristics of hysteria. These may occur suddenly, and in union, so as to characterize a mild hysteric paroxysm; or they may be variously combined, so as to leave little if any doubt as to the nature of the disease.

In other cases, however, these symptoms may be mere premonitions of convulsions, which are at times of an extremely violent character. In the case of a lady attacked with hysteria under this form, and whose muscles are by no means powerfully developed, the greatest efforts are required to retain her on the bed; the trunk of the body being twisted in all directions; the limbs being moved forcibly, so as to overpower all control, and the hands so forcibly clenched, as to resist every attempt at straightening the fingers. In this case, the paroxysms are occasionally those of catalepsy, with which—as we before remarked—hysteria has a most striking analogy. As the patient recovers from this severe attack, the fits of laughing and crying often recur, with indomitable hiccough. Frequently, the intelligence is preserved during the paroxysm, which indicates a wide distinction between hysteria and epilepsy: but, at other times, consciousness is entirely lost, as in catalepsy; or the intellectual and moral faculties are grossly perverted, so that obscenities of action and expression are indulged in, wholly inconsistent with the character and habits of the patient.

In one of those severe paroxysms, the patient may continue for a longer or shorter period; usually she recovers after a few hours rest, and is restored to her former condition, with the exception of the fatigue necessarily resulting from continued exertion, and generally some degree of lethargy, which gradually passes off.

A modern writer on hysteria, (*Tate*), considers a peculiar gnawing pain,—usually situate immediately below the left breast, in a hollow formed between the cartilages of the fifth, sixth and seventh ribs, and generally so circumscribed that it may be covered by a shilling—to be diagnostic of hysteria; and a later writer (*Professor Morton*, of Philadelphia) affirms, that, since his attention has been drawn to the subject, he has so repeatedly noticed the pain under the left breast, as to believe it to be characteristic of hysteric affections. Mr. Tate considers the pain to be seated in the intercostal nerve.

To the young practitioner, an attack of severe hysteria appears most formidable; yet the prognosis is always favourable. It is extremely rare for pure hysteria to terminate fatally, and when it does so, it is owing to superinduced mischief in some important organ. Like the neuroses in general, it may be converted into some other disease of the class; and, when such conversion does occur, it is commonly into epilepsy; so that a question of differential diagnosis may arise, as to whether the affection be really hysteria

or epilepsy: the history of the case; the absence of former attacks of epilepsy; with the previous presence of the signs that mark the hysteric habit, will generally elucidate the matter. The absence of consciousness, in an attack of epilepsy, has been regarded as an important diagnostic difference, but such absence may occur in hysteria and hysteroid affections.

The recurrence of the paroxysms of hysteria, in one predisposed to them, is generally very irregular; but on the application of any of the occasional causes, they may be developed. Usually, too, under the evolutions of the system that take place in the progress of life, the tendency to the disease is lost, and we rarely observe it after thirty or forty years of age. When long protracted, the impressibility of the nervous system is often so great, that the slightest impression, made on the nerves of sensation, will develop a paroxysm, or induce violent palpitation and syncope.

Causes.—It has been before remarked, that an unusual impressibility of the nervous system constitutes a predisposition to hysteria. This may be either natural or acquired; and it may exist in the male as well as in the female, although, for obvious reasons, it is more rarely met with in the former than in the latter. Any morbid or physiological cause, consequently, that develops this impressibility, may be reckoned amongst the exciting causes of hysteria. At the periods of menstruation, and of the commencement and cessation of the catamenial secretion, the system of the female is observed to be unusually impressible; at such times, a slighter exciting cause will develop the disease than at others, and when once induced, like the other neuroses, it more readily recurs.

Amongst the exciting causes, sudden and powerful mental emotions are the most common; but any source of irritation, especially when conjoined with debility, may occasion it.

It may be produced, likewise, by disordered states of important organs; by irritations in the digestive tube; and, doubtless, in the uterus as in other organs, whence irradiations proceed to the great nervous centres, from which they are reflected over the whole organism.

Pathological characters.—These—as in the case of the other neuroses—are not distinctive; but few persons die in a paroxysm of hysteria, and, when they do, the appearances are those of concomitant or consequent lesions, rather than such as throw any light on the nature of the disease.

It has been already remarked, that hysteria is properly a disease of the nervous system. At the present day, indeed, it is scarcely necessary to say, that it cannot be an affection of the uterus;—the whole train of symptoms implicating the functions of sensation, volition, and the mental and moral manifestations sufficiently show, that the seat of hysteria must be in the nervous system, and that there is no necessary connection between hysteria and the uterus. The organization and habits of the female render her, by her greater impressibility, more liable to attacks of hysteria, and the

condition of the uterus in health and disease, may, doubtless, be concerned in the causation, but in this way only. Hysterical symptoms occur both before the development of the uterus at puberty, and after the cessation of the catamenia; and, as was before observed, well marked hysteria is met with in men, of which the author has had a striking case lately. Such cases, it is true, are rare; but a single example is sufficient to show that there can be no necessary connection of the kind mentioned; yet a writer, already cited, (*Tate*,) asserts his conviction, that the protean forms of hysteria are referable to irritation of the spinal marrow, especially of its dorsal portion, and originally induced by a disordered condition of the uterine function; and he affirms, that hysterical affections "never do occur without a combined error in the nervous system and the uterine functions." The vague notions of that writer on the subject of "spinal irritation,"—as it has been termed—and of others, who have embraced his views, have passed, or are passing away; and the inaccuracy of the assertion, just cited from him, is so evident as to need no comment.

In the very irritable state of the nervous centres, which characterizes hysteria, we can readily comprehend, how irritative irradiations may be conveyed to the cerebro-spinal axis, whence they may be reflected, by the efferent nerves, to various parts of the economy. This we can comprehend; although the precise change in the nervous centres, which is present in hysteria, may entirely escape our cognizance.

Treatment.—The treatment of hysteria may be divided into that which is proper in the paroxysm; and that which is demanded in the intervals, for the purpose of modifying the predisposition, and removing the occasional causes.

In the paroxysm, the first object with the practitioner, is to remove the patient into a cool airy apartment; and to loosen all ligatures about the person. When the paroxysm is very severe, it is impossible to administer any remedies; but cold water dashed on the face, or the cold *douche* to the head, applied by pouring water from a height, from the spout of a teapot, or other appropriate vessel, will often arouse the nervous system to a different action, and curtail the paroxysm. With the same view, preparations of ammonia may be held to the nose.

In milder cases, and in the more severe, after the violent symptoms have passed away, stimulants, belonging to the class of reputed antispasmodics, may be used with advantage. Of these, the spirit of hartshorn, or the aromatic spirit of ammonia, one or other of which is generally at hand, may be given in a little water, as soon as the patient can be made to swallow. Before, too, even medicines can be given by the mouth, a stimulating glyster of turpentine¹ will succeed in cutting short the fit.

¹ R.—Olei terebinthinæ, ℥ss.
Ovi unius vitellum.

Tere simul et adde,
Aquæ tepidæ, ℥xj.—M.

Assafœtida glysters¹ have been recommended in such cases, but they act like any other stimulating enemata,—not by virtue of any direct antispasmodic property, which they possess.

¹ R.—Assafœtid. ℥ij.
Aquæ, Oss.—M.

The author has stated elsewhere, his doubts as to the existence of any direct antispasmodics, (*General Therapeutics*, p. 389, Philad. 1836,) and has expressed his conviction, that the *Materia Medica* contains no article of the kind; yet it is only in the disease now under consideration, that reputed antispasmodics are much used at this day. Hysteria, it has been seen, is a cerebro-spinal affection, and the symptoms that indicate it, are numerous and varied. There is scarcely a nerve, or a ramification, however small, which does not seem to participate occasionally in the pathological condition. In these cases, the object of the practitioner must be, to divert elsewhere the erethism present in one part of the nervous system, by impressions made upon some other. Hence, he administers substances, that are nauseous and stimulant, so as to powerfully impress the gustatory nerves, as well as those of the supra-diaphragmatic portion of the digestive tube, and of the stomach; and, with this view, he prescribes assafœtida;¹ castor, or valerian;² the spiritus ammoniæ fœtidus; the spirituous ammoniæ aromaticus;³ creasote,⁴ and other reputed antispasmodics during the paroxysm; and in the interval adapts his remedial agents to the indications that may present themselves.

¹ R.—Mist. assafœtid. ℥iv.
Tinct. ——— ℥ij.—M.
Dose, one or two tablespoonfuls, often repeated.

² R.—Tinct. castorei, seu
—— valerian. ℥iij.
Mist. camphor. ℥vj.—M.
Dose, a tablespoonful.

³ R.—Sp. aromat., seu
—— ammon. fœtid. ℥iij.
Mist. camphor. ℥vj.—M.
Dose, a tablespoonful.

⁴ R.—Creasot. ℥i—ij.
Mist. camphor. ℥iss.—M.
This draught to be taken occasionally.

Where signs of plethora exist during the fit, blood may have to be taken from the general system; but this is rarely needed.

The treatment, during the interval, must be regulated by the condition of the patient. If polyæmia exists, it must be combated by blood-letting, cathartics, low diet and regular exercise; but, usually, remedies of an opposite character are demanded. If torpor of the intestines be present, a brisk cathartic may be prescribed, which may act most beneficially, both as an evacuant and a revellent.

Where the habit is languid, the various chalybeate preparations, recommended in the treatment of the neuroses already described, may be advised; but advantage is rather to be derived from hygienic than from therapeutical agents.

With this view, attention must be paid to the condition of the digestive function: the bowels must be kept in a regular state; free exercise be taken in the open air; and cold and tepid bathing be

recommended; with a total avoidance of all sudden and violent emotions if practicable; and a distraction from all those causes, that are known to excite a paroxysm.

XIII. TETANUS.

SYNON. Entasia tetanus; *Fr.* Tétanos; *Ger.* Starrkrampf, Todtenkrampf, Todtenstarre, Steifsucht.

This disease consists in a permanent contraction of all the muscles, or merely of some, without alternations of relaxation. It is variously designated according to the seat of the contraction:—if, for example, it affect the levator muscles of the lower jaw, it is termed *Trismus*, *Entasia trismus*, *Locked jaw*; *Ger.* *Kinnbackenkrampf*; if the extensors of the body, so that the body is bent backwards, it is termed *Opisthotonos*, *Tetanus dorsalis*, *T. posticus*, *T. posterganeus*, *Raptus posterganeus*; *Ger.* *Rückenkrampf*, *Rückwärtsdreher*; if the body be thrown forward, *Emprosthotonos*, *Tetanus anticus*; *Ger.* *Vorkrampf*, *Vorwärtsdreher*; and if to one side, *Pleurosthotonos*, *Tetanus lateralis*; *Ger.* *Seitenkrampf*, *Seitendreher*.

Diagnosis.—It but rarely happens, that there are many premonitions of an attack of tetanus. In the traumatic form, the patient at times, gives evidence of great impressibility of the nervous system, with convulsive and other irregular conditions of the muscles of the neck and jaws.

Generally, the attack commences with trismus,—in other words, with permanent contraction of the masseter and temporal muscles, to such a degree, that the lower jaw cannot be depressed by any force that can be employed. At times, the tonic spasm extends no farther, until the expiration of one or more days, when the muscles of the neck become implicated, and contract in the same manner, and ultimately those of the trunk and limbs, when the tetanus becomes general.

Commonly, tetanus assumes the form of opisthotonos, but it may be of any of the varieties mentioned above.

During the violence of the disease, the body resists every effort to move it; and the muscles are indurated and drawn into knots; but after an uncertain time, the spasm becomes somewhat diminished, and the muscles so far relaxed, as to allow of some motion, and the prehension of liquids; but this remission is usually but a prelude to a more severe spasm.

When death takes place, which is the common result, it appears to be induced by asphyxia, owing to the mechanical phenomena of respiration becoming arrested; the animal functions remain almost unaffected, so that the patient may retain his senses almost to the very last. The circulation, if not hurried at the first, becomes so subsequently.

In the most fortunate cases, the disease is confined mainly to the muscles of the jaws, or is trismus only; but it commonly extends, in the mode above described; and, at times, the spasms are so

severe, that the unfortunate sufferer touches the soil only by his heels and occiput. Generally, too, the muscles of the abdomen and the diaphragm are affected with irregular spasms, which are the source of much suffering.

Usually, the intellect remains clear; and the pulse, in the early stages, is but little affected: during the spasms, however, it becomes accelerated; and, towards the fatal termination, as in other diseases, weak and frequent. It has been thought, that the patient was safe, if the pulse did not exceed 110 on the fourth or fifth day, (*Parry*); but this is a very insufficient ground for prognosis. Occasionally, the skin feels hot; and one of the greatest elevations of temperature, noted in the human body, was in a case of tetanus, observed by M. Prévost, of Geneva. The thermometer rose to nearly 111° Fahrenheit. (*W. F. Edwards*.) It would appear, indeed, from experiments on the lower animals, and pathological cases in man, that lesions of the upper part of the spinal marrow give occasion, at times, to an extraordinary development of heat. In the case of a man at St. George's Hospital, London, labouring under lesion of the cervical vertebræ, the temperature was marked at 111°. (*Sir B. Brodie*. See the author's *Human Physiology*, ii, 241, Philad. 1841.)

As to the duration of the disease, it sometimes terminates in a few hours; at others, not for several days, and even months. The average duration has been considered to be four or five days. (*Andral*.)

Of 58 cases, that terminated successfully, 8 recovered in a week; 3, in ten days; 4, in a fortnight; 4, in three weeks; 15, in a month; 4, in five weeks; 8, in six weeks; 3, in eight weeks; 3, in two months; and 2, in three months. (*Curling*.)

The prognosis in tetanus, and especially in the traumatic form, is extremely unfavourable. An eminent observer, (*Sir James Macgregor*), saw but few recoveries in the campaigns of the British army in Spain and Portugal; and another (*O'Beirne*) did not witness a single recovery in 200 cases. The trismus nascentium is described to be uniformly fatal, and the recoveries are doubtless few.

The circumstances, which give occasion to a more favourable prognosis, are—a long interval between the application of the cause and the accession of the disease; the slow progress of the tetanus, and the patient surviving beyond the fourth day; the spasms not being general, frequent or severe; the respiration easy, and the pulse natural. (*J. H. Bennet*.)

Causes.—There is doubtless a predisposition in the nervous system, which gives occasion to tetanus on the application of an adequate exciting cause. The disease is much more common in some regions and localities than in others.

In the West Indies, the *Trismus nascentium*, *T. neonatorum*; Ger. *Kinnbackenkrampf der Neugeborenen*, *Wangenscheurchen*, *Mundkrampfe*, is a very frequent and fatal disease; and at the

Havana, it is said to destroy a large proportion of infants, during the first fortnight. (*Don Ramon de la Sagra.*) It has been suspected, (*Andral,*) that want of cleanliness and ventilation have as much to do with this, as "the changes of temperature, that occur there so suddenly and so frequently;" and in support of this view, Andral remarks, that at Wilna, in Russia, where the climate is so different, the same affection is found among the Jewish infants, who are remarkable for the same want of cleanliness, and for being crowded together in a small space.

It is singularly frequent, likewise, in the Vestmann Isles, in the southern coast of Iceland. On these desolate rocks, the population of which does not exceed 160 souls, it was found, that in a period of 25 years, 186 infants perished of that disorder under the age of 21 days; and of these, 161 died between the fourth and tenth days after birth; 75 on the eighth day. The condition of life of these poor people is singularly destitute,—fish, and the eggs of sea-fowl, being their sole aliment; yet it is said, not to be so different from that of the Icelanders of the main land as to explain the frequency of this fatal disorder amongst them; and hence it has been suggested, that some constitutional and hereditary causes are concerned. (*H. Holland.*) It is more than probable, that the influence of locality has much to do in the causation, but how the organism is modified by these causes we know not.

It has been believed by some, that the trismus of the new-born is owing to inflammation of the umbilical arteries. (*Busch, Levy.*)

As regards traumatic tetanus, observation has shown, that elevation of temperature predisposes the nervous system to it, and hence we can understand, why the disease should be more common in torrid regions, and in temperate climates during the warmer seasons.

In a system, thus predisposed to tetanus, many causes may excite it into action. Of these, the most common are wounds, especially the punctured, the lacerated, and the gunshot, in parts like the extremities, which are liberally supplied with nerves; and it has been observed, in military service, that tetanus has more frequently supervened on such injuries, when the vicissitudes of the atmosphere had been considerable. (*Rostan.*)

Tetanus, caused by wounds, has been called *traumatic*, and it would appear, that in habits predisposed to the disease, any injury, however trifling, may induce it. It has followed the extraction of a tooth, and the prick of a needle. Traumatic tetanus is, perhaps, the most unmanageable variety.

In regard to the period at which the disease follows the infliction of an injury, nothing positive can be stated. In 128 observed cases, (*Curling,*) tetanus appeared from the 4th to the 14th day in 81. One case is recorded (*Robison,*) in which the disease did not supervene until ten weeks had elapsed. Another writer, (*Fournier-Pescay,*) has seen it occur after a month. An army surgeon, of large experience, never witnessed a longer interval than twenty-

two days; other distinguished surgeons (*Sir B. Brodie, Baron Larrey*) have not seen it after the 17th day, and Baron Larrey thought, that the French soldiers, during the campaign in Egypt, were safe after the 16th day. (*J. H. Bennet.*)

Another exciting cause of tetanus is cold, which gives rise to the *Tetanus algidus*. The first case of tetanus, which the author saw, was caused in this manner. A young man, when in a profuse perspiration, went into a river to bathe. He was immediately struck with tetanus, from which, however, he recovered under the treatment described hereafter.

It is affirmed, likewise, that pathological conditions of various organs,—as inflammation and irritation of the alimentary canal, and intense mental commotion,—have given rise to it; and it is well known, that we possess certain therapeutical agents,—as *nux vomica*, *strychnia* and *brucia*, which, in an adequate dose, occasion tetanic convulsions. At other times, again, the disease appears to occur without any appreciable cause.

Pathological characters.—The organic cause, or the precise condition of the nervous system, which gives occasion to tetanus, escapes us, in the existing state of knowledge. The brain has commonly been found after death without lesion, and, often, the spinal marrow also; and when morbid appearances have been found in the latter, they have not been always the same. At times, inflammation of the meninges of the spinal marrow; or of the spinal marrow itself; or of some of the nerves connected immediately with it, or of the neurilema of certain nerves, has been observed; at other times, effusion of blood or serum within the spinal sheath; or the formation of false membranes; or softening, or induration of the spinal marrow, or of the anterior column,—the one destined for motion; and, at others, again, when no evident lesion has been perceptible in the spinal marrow, the semilunar ganglions have been unusually red. It would certainly appear, that a modified condition of the spinal marrow must exist, in order that tetanus should be developed. In the enumeration of the exciting causes, it has been shown, that injuries or irritations, at a distance from the medulla, may develop tetanus *eccentrically*, (*M. Hall;*) but there can be no doubt, that the medulla spinalis must, under such irritative irradiations, be thrown into a pathological state, in order that tetanus may ensue. In other cases, it has been conceived, tetanus may arise from a morbid condition, commencing in the medulla or *centrically*; and this is probable; although certainly, in the majority of the cases, which fall under observation—those of the traumatic variety—the irritation is first induced in the terminal extremities of the nerves, and is thence extended to the spinal marrow. Whether this condition of the spinal marrow be one of inflammation or merely of irritation has been a question, which is yet unsettled. In the greater number of observed cases, hyperæmia of the medulla or its membranes has been found on dissection, but it is not always easy to decide, whether such ap-

pearances were the cause of the tetanus, or supervened during the excessive erethism of the nervous system, which characterizes the disease.

A recent observer, (*Gerhard*, of Philadelphia,) considers the alterations of tissues found on the examination of those who have died of tetanus to be purely accidental; and he states, that he has examined with great attention the brain and spinal marrow in ten or twelve cases, "and could not detect any lesion, which seemed to have the slightest influence upon the production of the symptoms."

The intimate nature of tetanus is unknown to us.

Treatment.—This has been generally unsuccessful, and has varied essentially according to the views entertained of the nature of the malady. They, who have looked upon it to be inflammatory, have advised blood-letting carried to a great extent, and cases are recorded of cure after this treatment; but it has often failed. A writer on this subject (*Lepelletier du Mans*) has detailed the case of a man from whom he took 12 pounds of blood at six times, and who recovered. Another observer (*Martin*) has reported several cases of cure thus obtained. He placed the patient in a warm bath, and kept him in it several hours, drawing three ounces of blood every hour; and, more recently, an eminent surgeon (*Lisfranc*) detailed to the Académie de Médecine the case of a man who was cured by bleeding him eight times in nineteen hours to about four cups each time; and, during the same period, applying 742 leeches along the spine, and 50 to the epigastrium. M. Andral—after referring to those examples—remarks, that if he had a case of tetanus to treat, he would "employ the antiphlogistic regimen in all its rigour;" and that he would apply the leeches, not only to the spine, but to the nape of the neck, and the jaws, and around the wound, if any existed.

In a disease, characterized by such exalted action of the nervous system, narcotics are at once suggested; and most practitioners, perhaps, rest their hopes on large doses of some article of the class. There is none so well adapted to fulfil all the indications as opium and its various preparations.

Opium may be given in the form of soft pill, in the dose of two grains every hour or two, until relief is obtained. When affected with tetanus, the nervous system resists powerfully the action of narcotics, so that enormous doses may be administered without the supervision of narcosis.

It is affirmed, that a practitioner administered, in ten days, four pounds, seven ounces, and six drachms of laudanum, and six ounces, four drachms, and forty-five grains of solid opium, (*Bégin*;) and Mr. Abernethy found thirty drachms of undissolved opium in the stomach of an individual who died of tetanus. Twenty grains of opium have been given every three hours, for several days. (*J. H. Bennet*.) At times, camphor, musk, and the various reputed

antispasmodics, are associated with the opium, but there is no marked benefit from the association.

By some, the morphia has been administered endermically, and advantage is said to have accrued from it in this form; but the same result would, doubtless, have been induced, had it been administered by the stomach. It may be used, however, endermically, when the trismus is so violent as to preclude the use of all internal remedies. A small blister may be formed over the mastoid process, or on the top of the sternum—these places being selected owing to their not being subject to attrition,—and three or four grains of the acetate, sulphate, or muriate of morphia, may be sprinkled on the surface from which the cuticle has been removed,—the aspersion being repeated several times in the day, if requisite.

Recently, the resinous extract of the *Cannabis Indica*, *Indian hemp* or *Gunjah*, has been recommended in the traumatic form of tetanus. (*O'Shaughnessy*.) It was given, at first, in doses of two grains every third hour, and, afterwards, of three grains every second hour, until the usual intoxicating effects were induced, when the spasms were, in some cases, mitigated, and in others wholly removed.

Tobacco has been highly extolled by many therapeutists, (*O'Beirne*, *Anderson*;) and a recent writer (*J. H. Bennet*) is disposed to regard it as the most efficient remedy of the class. It may be given in the form of enema sufficiently often to keep the system under its influence, care being taken that it is not pushed too far.

R.—Fol. tabaci, ʒj.

Aquæ ferventis, Oss.—M.

A modern pathologist, (*M. Hall*,) after laying down what he regards the first indication of treatment in traumatic tetanus, viz: to divide the injured nerves, observes, that the second is “to subdue the spasmodic affections by such remedies as the hydrocyanic acid.” We are satisfied, however, that narcotics are more powerful agents. Andral, indeed, says, it has never succeeded; but, it is asserted, (*Trevezant*,) that it was prescribed with advantage in a case of traumatic tetanus, in the dose of from two to twelve drops, after opium had been given in vain.¹ (See the author's *New Remedies*, 3d edit. p. 22: Philada. 1841.)

¹ R.—Acid. hydrocyan. gtt. ij. vel iij.

Syrup, ʒj.

Aquæ destillat. ʒxi.—M. et fiat haustus.

Revellents have in some instances succeeded. In the case of tetanus algidus, which fell under the author's observation, and to which allusion has been made already, the patient, who lived in the country, in the violence of the opisthotonos, was taken to a brook, which ran by the house, and the cold affusion liberally administered. Narcotics were likewise given; and under the combination he got well.

In the tetanus algidus, especially, we are satisfied, that not only the cold douche but the cold bath, and even the hot air or vapour bath may be beneficially employed to break in upon the morbid concentration of organic actions in the nervous centres.

It is proper, however, to remark, that cases are recorded, in which the patient died immediately on being plunged into the cold bath, (*Elliotson, Morgan, M. Hall;*) the remedy, therefore, should be adapted to the particular case, taking care that the shock occasioned is not too powerful. Revellents have likewise been directed to the intestines and to the cutaneous surface.

Cathartics may, indeed, be employed with two views; first, to evacuate the contents of the bowels; for in this, as well as in the neuroses already described, sources of irritation, scybala, &c. may be present in the intestinal tube; and, secondly, to induce revulsion. With this view, any of the ordinary cathartics may be given; or stimulating turpentine or other enemata may be thrown into the bowels.

The cutaneous revellents have consisted of blisters, or ammoniated lotions, (p. 282,) applied over the region of the spine; but the results have not been striking, whilst the irritation, induced by them, has seemed to be detrimental.

In this very anomalous disease, remedies of a character opposite to those mentioned thus far have been advised. Wine and bark have been given freely, and occasionally with success. (*Rush*, of Philadelphia, *Hosack*, of New York, *Currie*.) In one successful case, Dr. Hosack administered three gallons of wine in the course of three days. He was led to regard the disease as one of debility; and was informed by General Moreau, that lock-jaw was of rare occurrence in an army, when it first took the field, but that it was produced by the slightest wounds when the soldiers had become fatigued and debilitated by long marches and frequent battles. (*Brigham*, of Hartford.)

These are the main agents on which reliance has to be placed; but mercury pushed so as to excite salivation; antimonials, administered so as to keep up nausea; the tincture of cantharides, phosphorus, arsenic, the oil of turpentine, and various other agents, have been prescribed; and it is said, that where the tetanus existed in the pectoral muscles, advantage has been derived by causing the patient to breathe in a cadenced manner, (*en lui faisant cadencer la respiration*.—*Cruveilhier, Andral*.)

In the tetanus of warm climates, the internal use of the vinous tincture of the seeds of the colchicum autumnale—a powerful acro-narcotic—has been extolled. (*A. G. Smith*, of Port-au-Prince.) Dr. Smith begins with half a drachm, and increases the dose every half hour, repeating it until emesis or catharsis has been produced. The remedy is then discontinued.

In cases of traumatic tetanus, the division of the nerves presumed to be injured, and even amputation, has been proposed; but there

are few who vindicate the propriety of the latter measure. As a prophylactic, it is, of course, quite inadmissible. In all cases, it will, doubtless, be proper to freely cut any nerve that may be partially divided; but it is probable, that much advantage could not arise from either of the methods above proposed, inasmuch as although the cause of the disease may have been the wound, the disease itself is in those cases a peculiar affection of the nervous centres, which would still persist, after the division of the nerves, or the formidable operation of removing the limb.

As for the diet,—where the state of the spasm will admit of its being taken, it may consist of readily digestible and nutritious aliment,—as milk with the farinacea; but, at times, it is impracticable for days to administer any thing by the mouth. Under these circumstances, liquid food may be introduced into the stomach through a tube passed by the nostrils, or it may be thrown into the colon and rectum, where chylous matter may be separated from it in quantity sufficient to be inservient in part to the wants of the system.

XIV. RABIES.

SYNON. Rabies canina, Hydrophobia, Hygrophobia, Cynolyssa, Lyssa, L. felina et canina, Pantophobia, Erethismus hydrophobia, Clonos hydrophobia, Aerophobia, Phobodipsia; *Fr.* Hydrophobie, Rage; *Ger.* Wasserscheu, Hundswuth.

Hydrophobia literally signifies “a dread of water;” but this is not characteristic of the disease generally understood by the term. Not only is there a dread of water in rabies, but convulsions are induced by the sight of polished bodies, and of mirrors. Moreover, hydrophobia is occasionally met with in hysteria, (*Andral*); and in many febrile and other affections accompanied with excessive nervous irregularity and impressibility. Still, the dread of liquids is observed so generally in rabies, that the term hydrophobia has been retained by most writers.

The disease is extremely like tetanus, and, consequently, its consideration falls appropriately in this place.

Diagnosis.—The symptoms of rabies have been classed under two periods; the *first* comprising those before the occurrence of convulsions; and the *second* those that characterize the disease.

The symptoms of the first period occur at an indefinite interval from the infliction of the bite—at times in a fortnight, a month, or six weeks, and even later. Uneasiness is felt in the wound, which is occasionally re-opened; but, at other times, no local inconvenience whatever is experienced. The patient complains of dulness, and sense of heaviness in the head; is out of spirits; his nights restless, and disturbed by terrific dreams; the appetite fails; and there is an indescribable expression of dread in the countenance. These are, however, mere prodromic symptoms, which may occur where much dread is experienced without the existence of hydrophobia;

and this is strikingly exhibited in one variety of monomania—the *hydrophobic* of certain writers.

On the invasion of the second stage, the symptoms cease to be equivocal. The patient is attacked with a kind of convulsive shuddering, and soon afterwards with true convulsions, especially of the muscles concerned in deglutition and respiration. The fifth nerve in the face and in the fauces, and the pneumogastric nerve in the larynx, appear to be most inordinately impressible. The impression made upon these nerves, according to one pathologist, (*M. Hall*), is reflected upon the muscles of the pharynx and larynx, and the resulting sense of dysphagia or of dyspnœa is overwhelming. The convulsions recur in paroxysms more and more frequently, and with augmented intensity, until they ultimately destroy the sufferer; and the sight of liquids, or of any polished surface; or a flash of light, or the least noise, will often bring on an attack of the most horrible spasm of the laryngeal and pharyngeal muscles. When the patient endeavours to resist or overcome this dread of liquids, the mental and corporeal effort is signally distressing and horrific. Every muscle of the face is thrown into violent agitation, and those of the throat and trunk contract so forcibly and convulsively, as to threaten suffocation. These attacks or paroxysms last, at first, for a few seconds only; but, subsequently, they become more violent and prolonged, and the intervals shorter and more disturbed. In the generality of instances, the intellect is unaffected; and at times the patient will warn the bystanders to keep away, lest he should bite or otherwise injure them. Ultimately, all becomes agitation; the face is red; the eyes are sparkling; the pulse is small and contracted; and the convulsions, which now invade all the muscles, are horrible to behold. The expression of countenance is a mixture of agony and terror; a frothy and viscid saliva accumulates in, and flows from, the mouth; and, at length, the muscles of organic life participate in the mischief, so that there is constant vomiting, with hiccough; a cold clammy sweat breaks out from every part of the cutaneous surface; the powers of life fail; the pulse becomes small and intermittent; the respiration is accomplished with difficulty; and the patient sinks in the midst of the most awful sufferings.

The duration of the disease varies. Sometimes it proves fatal in 24 hours; at others, not until the expiration of six or seven days. The common duration has been estimated at from 50 to 60 hours.

Causes.—The disease in animals may be either *spontaneous* or *communicated*. In man, it probably never arises spontaneously; and perhaps in no animal does it originate in this manner, except in those of the dog, and the cat kind.

It has been affirmed, that true hydrophobia may be induced by powerful impressions made on the nervous system; and there is no doubt, that in hysteria or monomania, thus occasioned, many of the signs of rabies may be present—such as excessive impressibility of the nerves of deglutition and respiration, at the sight of

liquids, mirrors, &c.; but, although these neuroses strongly resemble hydrophobia, they differ from it in the circumstance, that the lesion of the nervous centres is to a slight degree only, and ends in restoration to health; whilst in the rabies, induced by the bite of an animal affected with the same disease, the individual almost always dies in a short time.

It has been argued, also, that in cases of the bite of a rabid animal, followed by the symptoms already described as characterizing hydrophobia, the affection is altogether imaginary, and, therefore, but a form of hysteria, or a state of the nervous system resembling it; but this view is overthrown by the fact, that it occurs in children, in whom the influence of the imagination cannot be presumed; and we know, that it is communicated from one animal to another. The author recollects a case, indeed, in which all the symptoms of hydrophobia were experienced by a highly impressible divine, after a bite received from an animal, enraged but not rabid. He had, in his alarm, perused different treatises on the disease, and wrought himself into the belief that he experienced the various feelings therein described. This was a case of *hydrophobic monomania*; from which he gradually recovered.

Some, again, have supposed, that the bite of a healthy animal can induce the disease, and that it really varies little—if at all—from traumatic tetanus. The diseases, doubtless, resemble each other, and are congerous; but they are not identical: and we cannot question the fact, that a rabid animal is capable of communicating a morbid poison to man by inoculation, which induces a peculiar disease to which we give the name Rabies or Hydrophobia.

This morbid poison is commonly—it has been imagined, exclusively—communicated through a wound, or a surface from which the epidermis has been removed, but, when placed in contact with a mucous membrane, whose epithelium is entire, it may—it is believed—communicate the disease. (*Andral.*) The application to the nose, of a handkerchief, impregnated with the saliva of a rabid animal, has been known to cause the disease in man. (*Chaussier.*)

It has been, generally perhaps, conceived, that the saliva, modified in its characters, is the agent by which the disease is induced in man; but others have believed, that the lyssic or hydrophobic virus is some secretion mixed with the saliva, and applied with it to the wounded part. This view was considered to be confirmed by the investigations of Marochetti—a Russian physician—who affirmed, that from the third to the ninth day of the disease, whitish pustules are perceptible near the frænum linguæ, which open spontaneously about the thirteenth day. The views of Marochetti have not been confirmed by other pathologists, but M. Gendrin affirms, from the results of the dissection of numerous persons who have died of hydrophobia, that the only disorganization he has met with, is a considerable development, mostly inflammatory, of

the mucous crypts at the base of the tongue, the pharynx, and the upper aperture of the larynx.

Analogy would seem to show, that the morbid poison is some distinct secretion from the blood. In hydrophobia, as in smallpox, the blood of a rabid animal has been injected into the vessels of a sound animal, yet no effect has been induced. It is affirmed, that a person became hydrophobic from touching the skin of a rabid animal; yet persons constantly do the same with thorough impunity. An eminent pathologist, (*Andral*), on dissecting an animal that had died from hydrophobia, ran a splinter into his finger, yet no bad results followed. Recently, however, cases have been published, in which lambs became rabid merely from sucking ewes, which had been bitten by a mad dog; for the lambs were removed a month before the ewes became affected, and not the slightest scar was perceptible on any of them. (*H. S. Steele*.) Still, the lambs may have been bitten by the dog, for a number of sheep were attacked by him, several of which died hydrophobic; and, perhaps, in the present state of our ignorance on this matter, it is presumable, that a secretion takes place from some portion of the pulmonary or digestive mucous membrane, which, like the matter of the smallpox pustule in cases of variola, is the morbid poison.

In cases of the bites of animals decidedly rabid, hydrophobia does not always result. A recent writer (*Wagner*) affirms, that he has witnessed many instances of entire impunity under such circumstances, although the remedies employed were merely such as were suggested by superstition; whence he is led to infer, that in man, a predisposition to hydrophobia very rarely exists.

It has been an interesting question, whether a man labouring under hydrophobia can communicate the disease to his fellow man. The feeling—the apprehension—is, that he certainly can; but we want facts on this subject. A professional friend of the author, when attending a patient labouring under hydrophobia, heedlessly put his finger on the patient's tongue, to examine the condition of the throat, and it was not until afterwards, that he recollected that the skin was abraded. He applied to the author under great anxiety; but had previously excised and cauterized the part. On this head, the author could find nothing satisfactory in books, but in the absence of the necessary information, he comforted him with the assurance, that if man could communicate the disease to his fellow, such cases could not fail to be on record. No hydrophobia supervened.

It is proper to remark, however, that evidence has been adduced recently, (*Breschet*), that rabies may be transmitted from man to the dog, by inoculating a dog with the saliva of a hydrophobic patient. Thirty-eight hours after such an inoculation, the dog became furiously rabid, and bit several dogs which also became successively rabid. Some of the dogs drank water with avidity. The period of latency of the poison is stated to have been twenty or thirty days. (*Breschet, Magendie*.)

How it is, that the hydrophobic virus, thus placed eccentrically, affects the great nervous centres, in the manner described, is most mysterious. Often, the disease does not break out until the wound has wholly healed, and the recollection of the occurrence been entirely banished.

Pathological characters.—As in tetanus, the morbid appearances in hydrophobia are not characteristic; they, indeed, strikingly resemble those observed in all deaths from convulsions. The meninges of the brain and spinal marrow have been found injected, and the neurine itself has been softened; but, in most cases, these appearances have been wanting; and when they have been present may have arisen secondarily. An observer to whom reference has been made, (*Gendrin*,) affirms, that he has never seen the least trace of inflammation, or of any lesion whatever, in the encephalo-rachidian organs, or in the ganglionic nerves. It was before remarked, that the only disorganization he had noticed was a considerable development, mostly inflammatory, of the mucous crypts at the base of the tongue, the pharynx, and the upper opening of the larynx. The salivary glands have been observed red and swollen, and, in one case, the epithelium of the œsophagus was eroded; the stomach, too, has exhibited signs of hyperæmia, and the follicles of the intestines have been greatly developed. The air passages have been seen filled with a frothy fluid; and congestion of blood has been observed in the branches of the pulmonary artery, and in the right side of the heart, as in cases of death by asphyxia.

Treatment.—There is no disease in the whole catalogue, which we attack more hopelessly than this. The most important part of the treatment is the prophylactic. Whenever the part can be freely excised, this must be done. No matter how late may be the period after the infliction of the injury, provided the symptoms of hydrophobia have not appeared, this course has been recommended; (*M. Hall*;) although it is very doubtful whether excision can be of any advantage after many days have elapsed, and time has been allowed for the production of the morbid condition of the nervous system requisite for its development. Still, it will be erring on the safe side to practise it; and should pain and swelling commence, at any time, in the wound, it may be warrantable to have recourse to excision. (*J. H. Bennet*.) A case is recorded, in which, it was practised thirty-one days after the bite, even after the hydrophobic symptoms had appeared, and the patient's life was saved. (*Professor Rush*, of Philadelphia.)

Where excision cannot be easily performed, the red hot iron, heated to whiteness, should be applied so as to disorganize the whole wounded surface; the potential cautery should only be used in cases where the actual cautery is inadmissible. If the potential cautery be employed, either the potassa fusa, the chloride of zinc, or the butter of antimony¹ may be chosen.

¹ R.—Zinci chlorid. part. i.
 Farinæ tritici, part. iss.
 Antimon. muriat. part. ss.
 Aquæ font. q. s. ut fiat pasta.

To be applied by means of a moistened hair pencil.

Before cauterizing the part, if called early, the wound may be enlarged, be well washed with water, (*J. Mease*, of Philadelphia,) be scarified, and have cupping glasses applied over it, so as to extract as far as possible the virus. It has been suggested, also, that a tight ligature should be applied a short distance above the laceration. (*M. Good*.)

By several of the Italian and other physicians—(*Brera*, *Previtali*, *Ghisaldoni*, *Agliati*, *Wendelstüdt*, *Ruppius*,)—the aqua chlorini has been used both internally and externally as a preventive. (See the author's *New Remedies*, 3d edit. p. 142: Philad. 1841.) Much fallacy may arise, however, in regard to the agency of reputed preventives; as all who are bitten by a rabid animal are not attacked with hydrophobia; hence the reason why we have so many preventives of this as well as of other diseases.

When the disease has once become developed, and the true hydrophobic symptoms have appeared, no remedial treatment can be depended upon.

When *M. Marochetti's* views in regard to the sublingual pustules were first promulged, hopes—slight, however—were entertained, that by the cauterization of the pustules, as they appeared, and by washing them, as he advised, with the decoctum genistæ, the disease might really be removed; but subsequent observation proved the fallacy of those slender hopes.

All the remedies, enumerated under tetanus, and many more, have been tried, but the same unsuccessful results have usually followed all.

In India, a happy termination ensued, from excessive bleeding, as recommended by *Boerhaave*, in two cases, (*Timon* and *Shoolbred*;) but in others in which it was pushed to the same degree, it failed; and it has even been doubted whether *Shoolbred's* cases were hydrophobia. (*Troiliet*, *S. Cooper*, *J. L. Bardsley*.)

The injection of a large quantity of warm water into the veins was recommended in one case, (*Magendie*;) the patient appeared soothed, but the paroxysms recurred, and ultimately proved fatal. Opium was associated with it, (*Dupuytren*,) but the results were not modified.

It has likewise been suggested, that a solution of morphia should be injected into the cephalic vein,¹ (*Booth*;) and that the injection should be repeated at intervals of ten minutes, if no effect be observed; but this has not been more happy than many other suggestions; (*J. L. Bardsley*;) as in tetanus, the quantity of opium administered has been enormous.

¹ R.—Liq. morphiæ acet. ℥. xxiv.
 Aquæ destillat. ʒij.—M.

In a fatal case, a distinguished London practitioner, (*Babington*), besides administering half an ounce of laudanum in injection, gave 180 grains of opium internally in eleven hours.

In one case, the disease appeared to be mitigated by the free use of the hydrocyanic acid, (*A. T. Thomson*;) and as death results from asphyxia, the propriety of tracheotomy has been suggested. (*H. Mayo*.) A recent author (*M. Hall*) remarks, that if a case were committed to his charge, he would combine these two modes of treatment. The experiment may be made, but the termination—it is to be feared—will not be changed.

It is a question of great interest to decide at what period after a person has been bitten, he may be considered free from all danger. Unhappily the evidence we have on this subject does not admit of this being fixed. A recent writer (*J. H. Bennet*) has collected the testimony of various observers, which sufficiently exhibits the want of regularity in this matter. Of 131 recorded cases, none became indisposed before the 11th day after the bite, and only 3 before the 18th. (*S. Cooper*.) Of 15 other cases, 7 were attacked between the 14th and 30th days; 5 between the 30th and 40th; 2 a little after that period; and 1 after 14 weeks. (*Troilliet*.)

Cases, however, are recorded, in which the disease broke out in two or three days, and others, in which it did not supervene until the expiration of several months—nine, (*J. Vaughan*;) eleven, (*Mead*;) twelve, fifteen, (*Brown, Adams*;) nineteen months; and even of years; but it may well be questioned, whether the disease was fairly referable to the assigned cause in these last cases. It is impossible, however, to lay down any precise period of safety; and when it is fixed by one at 17 months; by another at 19; and by another (*J. L. Bardsley*) at two years, the estimates are the mere opinions of their authors. This much, however, may be said;—it is exceedingly rare for any case of rabies to appear in an individual three months after he has been bitten.

To avoid the severe spasms, which are induced by the sight of anything bright or glistening, it has been advised, that the sufferer should be kept in almost perfect darkness, (*Triberti*;) and it has been suggested, that at the commencement of an attack, compression of both carotids may be used with advantage. (*Allier*.)

Before leaving this disease, it may be well to make a few remarks in regard to the indications of rabies in the dog; in which—as well as in the lower animals—there is no *hydrophobia*—no dread of water. The dog, although unable to swallow, flies to it with eagerness, and all other rabid quadrupeds, with perhaps an occasional exception in the horse, are said to drink with ease, and increased avidity. (*Youatt*.)

A modern observer, who has had great opportunities for noticing animals in this state, (*Wagner*), lays down the following rules for guidance:—The moment a dog evinces any traces of illness, it is no longer to be trusted; and it would be well to lock it up, or fasten it

to a stout chain. But when it begins to gnaw wood, to show a dull eye, to snap at animals with which it had become familiarized, and to bark hoarsely; when it attempts to run away or to break its chain; eats and drinks with a snapping gesture; at intervals, appears lively; and then again sneaks sulkily to its kennel; when it disregards its master's call, and, contrary to its former habits, growls and snarls at well-known persons, the animal ought to be despatched; for there can no longer remain a doubt of its being rabid.

XV. DELIRIUM.

SYNON. Deliratio; *Fr.* Délire; *Ger.* Irrereden, Phantasiren.

By this is meant a wandering or straying of the mind from the rules of reason,—a kind of incoherence so often associated with fever, that the term *delirium cum febre* has been usually assigned to it,—to distinguish it from the *delirium sine febre* or mental alienation. Still, ordinary delirium may occur without any manifestation of fever.

Causes.—Delirium may be *eccentric* or *centric*,—that is, dependent upon causes seated out of the encephalon; or upon such as act immediately upon it.

In highly impressible persons, the slightest pain or irritation in any part will induce it by causing modifications in the encephalic function, which are totally inappreciable to us. This is a case of the eccentric kind. At other times, it is induced by causes that act immediately on the brain or its meninges, as has been pointed out under encephalitis, and hyperæmia of the encephalon. But it may, also, occur in a very opposite condition of the brain, where there is defective excitement. Hence, it is not an uncommon effect of exhaustion from excessive loss of blood, (*M. Hall*), as well as in fevers, in which the nervous function has been depressed by long continued over-action,—as in typhoid and typhous fevers,—those which are classed by some writers as the ataxo-dynamic. Another form of delirium—mentioned under the next head—supervenes on the abstraction of excitants, to which the economy has been accustomed. It may likewise be caused by substances, which act upon the brain, directly or indirectly,—as alcoholic drinks and narcotics. The drunkenness, induced by the former, is a species of delirium, and is, doubtless, partly occasioned by the action of the alcohol upon the nerves of the stomach, whence it is propagated to the encephalon; and, partly by its entering the veins of the stomach, and proceeding with the blood to the encephalon. Certain it is, that in these cases the odour of alcohol has been manifest in the ventricles of the brain, and signs of hyperæmia have been perceptible in both the vessels of the encephalon and its meninges. Experiments, too, have been made on animals, which show, that when alcohol has been introduced into the stomach, it may be found in the blood, and in the brain a few moments afterwards, (*Andral*;) and all the symptoms of intoxication can be induced by introducing alcohol into the veins of an animal.

Pathological characters.—The portion of the brain, implicated in delirium, has not been positively determined: as the cortical part has been supposed, by many physiologists, to be the seat of intelligence, delirium has been placed there also; but we are still in want of information on this matter. In many cases, signs of encephalitis or of hyperæmia are manifest on dissection, but in others, there is evidence of neither one nor of the other; and even when hyperæmia or signs of inflammation exist, it may be a question, whether they were subsequent, or antecedent to the aberration; but this question will fall again under notice, when treating of Mental alienation.

Treatment.—In the form of delirium, which is produced *eccentrically*, regard must be had to the removal of the cause, and to the modification of the encephalic faculties, if the derangement can be appreciated. The use of antiphlogistics, provided indications for them exist, and of full doses of narcotics if the delirium be excited by intense pain, or be of a nervous character, are indispensable. (*Padioleau.*) The local mischief must always be removed, or, if this cannot be accomplished, be masked. The delirium, under such circumstances, will generally yield spontaneously.

In cases of injuries followed by delirium, but unaccompanied by febrile excitement, which has been termed "*nervous delirium*," antiphlogistics fail to be indicated, whilst opiates and narcotics in general are most beneficial.

Where delirium is induced by alcoholic drinks or by opiates, it passes off spontaneously in the majority of cases. Emetics may be administered if required. They act beneficially by evacuating the fluids, which may still be in the stomach, and, by their revellent operation, are well adapted for arousing the individual, if he be disposed to fall into a state of coma or stupor. Blood-letting, too, may be needed, as well as sinapised pediluvia, and the cold douche to the head, with copious draughts of water. In animals, intoxicated by alcoholic fluids, the drunkenness is said to have ceased on the free exhibition of cold water. (*Andral.*)

Nearly allied to delirium, and to ordinary dreaming, is the affection commonly called *Nightmare*, *Ephialtes*, *Ephialtes nocturnus*, *Incubus*, *Epilepsia nocturna*, *Oneirodynia gravans*, *Erethismus oneirodynia*, *Asthma nocturnum*; Fr. *Cauchemar*, *Cauchevieille*, *Cochemar*, *Oneirodynie gravative*; Ger. *Alpdrücken*, *Trute*, *Alp*—which is characterized by a sensation of distressing weight at the epigastrium during sleep, and of impracticability of motion, speech, or respiration. "The sensation," as correctly expressed, (*M. Good*), "is said to be frequently preceded by some fearful dream, as that of an implacable enemy, known or unknown, in close pursuit of the dreamer, from whose grasp he feels incapable of escaping; or of exposure to some overwhelming danger by sea or land,—as that of falling from a steep precipice; or struggling amidst

the ruins of a shipwreck, with rocks and breakers that threaten to dash him to pieces every moment."

Although these disagreeable dreams make an impression on the individual, which induces him to seek occasionally the advice of a physician, they differ but little, if at all, in their character, from ordinary dreams, in which the individual feels, that he is made to take a prominent part. Thus, many persons dream, that they have the faculty of flying over the heads of others, and performing sundry feats, which are equally impracticable. Nightmare was at one time ascribed to the person's being "possessed." Hence, in the Anglo-Saxon language, it was termed *Elfsidenne* or *Elf-squatting*. The male spirits were termed *Incubes* and the female *Succubes*.

The affection is often dependent upon the condition of the stomach; although, with some persons, it recurs every night, even when they are in perfect health. Should it be owing to supper taken at too late an hour, or to any appreciable cause, these agencies must be removed. Occasionally, it is experienced in one position of the body and not in another; and it has been advised, that the character of the bed should be changed, and that a mattress or harder bed than usual should be used. (*Darwin*.) It is impossible to lay down any therapeutical management, which is adapted to all cases.

XVI. DELIRIUM TREMENS.

SYNON. Mania à Potû, Cœnomania, Mania e Temulentiâ, Delirium Potatorum, D. ebriositatis, D. tremifaciens, Erethismus Ebriosorum; *Fr.* Délire tremblant, Folie des Ivrognes, Encéphalopathie crapuleuse; *Ger.* Säuferwahnsinn.

This disease is extremely common, both in this country and in many others, and is owing to the abuse of spirituous liquors, or of opium, and other narcotics; for well-marked cases of the disease are seen in opium-eaters, and something closely resembling it in persons who use tobacco too freely. It is one of the most frequent diseases, that fall under the care of physicians to extensive eleemosynary establishments—as the Philadelphia Hospital. It consists essentially of delirium with tremors,—hence the name "Delirium Tremens;"—and it is placed in the arrangement of one pathologist, (*Dubois d'Amiens*), as a terminating point to convulsive affections, and as forming a kind of transition between these and mental diseases.

Diagnosis.—In hospital practice, we meet with it in three forms. The *first*, is, perhaps, little more than simple intoxication,—the tremors and hallucinations passing off as the effects of the stimuli cease. In the *second*, the tremors continue longer with little or no mental aberration; and in the *third*, the whole nervous system is thrown into the greatest irregularity;—the upper extremities being tremulous in a high degree, and the mind completely unhinged; so that the senses of vision and audition are affected with the strangest hallucinations; and, at times, the patient is furiously

maniacal. If this state continue—as it often does for days—there is, during the whole time, a total want of sleep, or the forgetfulness is for an extremely short period. Usually, the patient fancies, that he sees objects in the chamber;—insects crawling on the walls or bedclothes, which he occupies himself in endeavouring to lay hold of; and hears persons calling upon him from all parts of the house, so that if permitted, he would run about from one place to another, responsive to the ideal summons.

The organic functions participate with the animal functions in the disorder. The respiration is generally short and hurried; the circulation quick and feeble; and, in bad cases, almost, if not wholly, imperceptible at the wrist; and the body is bathed in a cold clammy perspiration. The digestive function is, likewise, generally impaired,—the appetite being null; and, frequently, everything taken into the stomach is immediately rejected.

The duration of the disease varies. Commonly, it terminates, in a few days, in health; but, on other occasions, it is more protracted. Death is not a common occurrence, and when it does take place, it is generally preceded by coma.

Causes.—Abuse of alcohol, or of opium, is, doubtless, the exciting cause of the disease; and, hence, it is more frequently seen in large towns than in the country; and amongst the lower, rather than the better, classes.

It may make its appearance during the sustained use of those articles, but this is probably rare. In almost all the cases, that have fallen under the author's care, and where the history could be traced, it supervened on the withdrawal of the accustomed stimulus. Under such circumstances, the function of innervation, habituated to excitement, is thrown into great irregularity, as it ceases to receive its wonted stimulation.

A recent writer (*Stokes*) lays considerable stress on the two opposite conditions under which it may occur,—after a debauch, or on the sudden suspension of the habitual use of alcoholic liquors. In the *first* case, he believes the pathological state to consist in gastritis, accompanied with high excitement of the brain and nervous system, owing to the absorption of alcohol or to sympathy with the stomach, and tending strongly towards inflammation of the brain; yet, in such case, the gastritis may be masked by the irritation in other organs; the abdomen may not be tender, nor the tongue red, and all the symptoms may indicate a morbid condition of the brain, and yet violent gastric inflammation may be existent at the time. In the *second* case, the functions of the brain, Dr. Stokes considers, are disturbed by the abstraction of an accustomed stimulus.

Delirium tremens is a disagreeable and uncomfortable complication in severe wounds and bruises, and is often seen in our hospitals; but it is questionable, whether it ever occurs except in persons, whose constitutions have been predisposed to it by the abuse of some kind of narcotic. This form of delirium has been termed *delirium traumaticum*, (*Dupuytren*), and it certainly does not ap-

pear very unlike delirium tremens in its characteristic features. (*Professor Cross*, of Lexington.) It is asserted, too, to have been induced by great mental depression; but such cases must be exceedingly rare. A Danish writer (*Höegh-Guldberg*,) finds but one case in 173 in the female, but in this country, as well as in England, the ratio of females is very much greater: probably the female, owing to her greater nervous impressibility, is more liable to it, but escapes only in consequence of avoiding more the great causes.

Pathological characters.—As in the other neuroses, the appearances on dissection have thrown no light on the nature of the disease. Frequently, none are visible; at other times, signs of hyperæmia of the nervous centres, or of inflammation of the meninges, with effusion of serum into the ventricles, and of coagulable lymph from the vessels of the arachnoid, have been met with. A distinguished pathologist, (*Andral*,) opened several persons who had died of the affection, and although he found, at times, evidences of disease in the meninges, he did not hesitate in dating their occurrence long after its invasion. The author's pathological investigations have led him to the conclusions mentioned above. He has not been able to discover any pathognomonic appearances; and it is probable, that the disease is situate in conditions of the neurine itself, which are inappreciable.

Treatment.—As the disease, in the mass of cases, appears to be caused by the withdrawal of a stimulus to which the nervous system has been accustomed, it is not surprising, that a recurrence to the use of the particular stimulus should be recommended. This is the course most commonly advised by practitioners, and there can be no doubt, that it will usually cure the disease,—if the restoration of the patient to the condition in which he was, before the stimulus was withdrawn, can be esteemed a cure.

The quantity of alcohol, which the patient will bear, is astonishing. The nervous system of the stomach has lost its ordinary impressibility, and the same may be said of the brain. A common plan is to begin with a tablespoonful of brandy, mixed with an equal portion of water, and to administer this every half hour, or hour, until the hallucinations cease, and sleep is restored; and there can be no question, that it will generally be effectual,—as frequently, perhaps, as any other system of treatment. A great objection to it is, that the patient is confirmed in his habits, and taught to believe that alcohol has become indispensable to him. In many of our eleemosynary institutions, in which the plan of treating delirium tremens by alcohol is adopted, patients are known to return to the hospital whenever they are unable to obtain their usual quantity of spirit, and find, that they have—what they term—“the horrors” in consequence.

Most generally, perhaps, opium is regarded as the most efficacious remedy, and many practitioners are of opinion, that it alone is necessary. There is no question that this article, again, will be found effectual in the mass of cases. In the great irregularity of the function of innervation, which characterizes the disease, the

nervous distribution may be equalized in two modes; in one case, by stimulation, which may be termed equalizing upwards,—by alcohol, for example; and, in the other, by sedation,—by large doses of opium, for example; and if once the equalization is accomplished by either course, tranquillity and sleep will follow. But the disease does not always yield, when sleep has recurred, although it is a most favourable sign. The author has known many cases in which the disease persisted in considerable violence for some days after sleep had been induced.

The practitioners, who employ opium most freely, give it in the dose of from one to three grains every hour, until sleep succeeds. The wonderful resistance, on the part of the brain, is exhibited again in the case of opium; which does not occasion narcosis, even when pushed to an enormous extent. Thirty or forty grains have often been given in less than the 24 hours, without any of the ordinary effects being observed. When a tendency to sleep is evinced, the opium is discontinued; and, when given in large doses, its operation ought to be watched. (*B. H. Coates*, of Philadelphia.)

The French practitioners speak of one hundred drops of the laudanum of Rousseau—seven drops of which are considered to contain a grain of opium—in the course of an hour, (*Andral*), and of two drachms in the course of the day, (*Dubois d'Amiens*), as being sufficient to induce sleep. The practice, they say, was adopted from the English. (*Andral*.)

The treatment by opium, or that by stimulants, is adopted by the generality of practitioners; but some, who regard the disease to be inflammatory or hyperæmic, have recourse to antiphlogistics from the commencement of the attack. There may be, and doubtless are, cases exhibiting the ordinary signs of encephalitis, or of hyperæmia of the nervous centres, in which the abstraction of blood may be serviceable; but such cases are rare; and in those which present themselves in hospital practice—where the disease is chiefly seen—the indication is scarcely ever met with. Free blood-letting has, indeed, been observed to induce a degree of sinking, both in young and old, from which no means could restore the patient. (*M. Hall*.)

Should such symptoms exist as those described above, cupping—dry, and with the scarificator—may be employed with as great a prospect of relief, and less risk of injury.

By others, the treatment has been made to consist almost exclusively in the employment of emetics. (*J. Klapp*.) On them, at least, the main dependence has been placed. When the patient is first seen by the physician, it may be advisable, in many cases, to evacuate the contents of the stomach; and, at a subsequent period, the equalizing and revellent agency of an emetic may be employed with advantage; but it is very questionable, whether much good can arise from the repeated administration of agents, whose action may exhaust; and, under such feelings, with the absence of any

markedly beneficial results from their use in many cases, they are by no means generally prescribed by practitioners.

The course, pursued by the author in the treatment of delirium tremens, has been entirely eclectic, in many cases expectant, and the results have been such as to satisfy him. Under the view which he entertains of the nature of the affection—that the irregularity of nervous action is induced by the withdrawal of an accustomed stimulus, and that the recuperative powers are, generally, entirely sufficient to bring about the necessary equalization, he has treated the mass of the cases, which have fallen under his care, without either excitants proper or opiates. In the first instance, an emetic has been given at times, for the reasons above stated; and, afterwards, the patient has been kept in a state of tranquillity in his chamber,—the intrusion of too much light and noise being prevented; and, where the stomach would retain it, gently nutritious and easily digestible diet has been prescribed; the bowels have been kept open by gentle cathartics; and this has comprised the essential part of the treatment. In time, the hallucinations have disappeared, sleep has returned, and entire restoration supervened.

Under the idea, so generally prevalent, that the patient will sink unless stimulants or opium are given,—if the attack be severe, the physician is apt to become alarmed, and to fly to those agents; but if he will persevere, he will find, that his fears are groundless, and he will be encouraged in his course, when he reflects, that, by administering either brandy or opium, he cannot infuse fresh vitality into his patient, and can only act on the excitability that is already present in the tissues.

In the female lunatic asylum of the Philadelphia Hospital, the course here recommended has been advised, during the author's term of attendance as one of the physicians to the establishment, and where it has been carried out, the general result has been satisfactory, in more respects than one. It has, in the first place, restored the individual to health—not perhaps as rapidly as either brandy or opium, but more permanently. The term “restoration to health” is hardly, indeed, applicable to the change effected by the former remedy: the patient is merely placed in the condition in which he was before the stimulus was withdrawn; and, as he was “restored” by the brandy, he is apt—as before remarked—to regard it as indispensable to his healthy condition.

In the “total abstinence” plan, however, the habit of drinking is broken in upon, and even if it should require a short time longer to restore the individual, there is the consolatory reflection, that delay is not useless; as every day's privation of the wonted stimulus diminishes the feeling of necessity, and the desire for it. One evidence of the good effect of the course is, that they who are dismissed cured, rarely, or never, return to the wards. This is an observation, that has been made at the Philadelphia Hospital, and as it concerns paupers, it is probable, that the cures are real and

permanent, for were it otherwise, they would, on subsequent attacks, be compelled, in their destitution, to seek the wards of the same excellent charity.

Under this eclectic course, it may be advisable, however, in certain cases, to administer both excitants and opiates. Where a person has been accustomed for years to the daily use of large quantities of alcohol, the nutritive functions totter under the irregular innervation, and the recuperative powers seem to be insufficient to restore the balance of nervous action. These cases are, however, extremely uncommon. In like manner, where sleep has not recurred, after a continuance for some days of the plan above advised, a full dose of opium,—two or three grains in the form of a soft pill, will frequently form an excellent adjuvant.

There are cases, too, in which the irritability of the stomach is so great, that no food or medicine can be retained, and the patient becomes exhausted by the irritation.

A blister, applied over the pit of the stomach, and the blistered surface sprinkled with the sulphate or acetate of morphia, (two to four grains at a time,) may allay the vomiting, after which such internal management may be adopted as the case may seem to demand.

A recent writer (*M. Hall*) remarks, that “it becomes a serious question, whether any stimuli should be allowed” in delirium tremens. Our observation and reflection are—in the main—in favour of the negative; and the remark is applicable to the various excitant antispasmodics that are wholly trusted to by some, because the disease is characterized by tremors.

All these “antispasmodics”—*assafoetida*, *castor*, *spiritus ammoniæ foetidus*, &c. are, like *capsicum*, mere stimulants. They are not possessed of any specific power over the disease, and are never employed by the author, unless he is desirous of exciting a new nervous impression on the gustatory nerves, and on those distributed to the lining membrane of the stomach. The same may be said of the cold shower bath or *douche*. The shock or new impression, made by it, is at times salutary, but some discrimination is needed in regard to its application to those whose powers are greatly prostrated.

Admitting, then, that there may be cases, which demand something more than the expectant or eclectic treatment, these cases are certainly small in number; and a careful classification, by separating those who are considered to require imperiously the use of stimulants from those who do not, cannot fail to lead to results in the highest degree satisfactory to the philanthropist,—first of all, by preventing the indiscriminate treatment by alcohol adopted by many, and secondly—as a consequence of this—by leading to a more extensive reformation in the patients themselves.

One of the author's colleagues in the Philadelphia Hospital (*Dr. Gerhard*) is an energetic supporter of the method of treating the generality of cases by the free exhibition of alcoholic liquors, and,

in support of it, cites the results observed in the men's wards under his care, from October 12th, 1839, to October 12th, 1840. Of 162 cases of decided delirium tremens, 87 were admitted in the first stage; 73 in the second; and 2 in the third: 160 cases recovered, and 1 remained convalescent, who is since well. "One only proved fatal; the patient was admitted in the third stage of the disease, and died in a few hours after his entrance; he had been treated with opium; and a box of pills, which he was taking, was sent to the hospital with him." "Of course," adds Dr. Gerhard, "this apparent exception confirms the general conclusion, that the disease terminates favourably in every instance when treated according to the method recommended."

Any inference, however, from a single year's observation, may be fallacious; and especially may it be questioned, when the results of a similar treatment adopted by the same observer and by others had been previously less markedly favourable. It is a well known fact, that in certain seasons and years diseases are more severe than in others; and the circumstance, that of the 162 cases of delirium tremens referred to by Dr. Gerhard as having been admitted in the year ending October, 1840, only two are classed in the third stage, sufficiently exhibits, that the disease must have been unusually mild. The author has now before him a summary of the cases treated in the men's and women's lunatic asylum of the hospital from January 1st, 1839, to January 1st, 1840, politely furnished him by another estimable colleague, (*Pennock*, of Philadelphia,) from which it would appear, that the number of cases admitted into both asylums during the year was as follows:—

Delirium Tremens.				Men.				Women.
First stage,	-	-	-	91	-	-	-	40
Second do.	-	-	-	78	-	-	-	12
Third do.	-	-	-	31	-	-	-	15

Of those in the third stage on the men's side, 6 are reported to have died,—that is, 1 in 5; of those on the women's side, 2; that is, 1 in 7.5. In the first and second stage, none died on either side. It cannot, consequently, be considered, that Dr. Gerhard has settled the value of the treatment "upon a more definite basis than has yet been done." The investigations ought to be continued through a succession of years; the different methods of treatment be compared extensively, and under circumstances as nearly identical as possible, before any such conclusion can be considered as established. Moreover, the results obtained by Dr. Gerhard—successful as they were—are not more so than those recorded by an observer already cited, (*J. Klapp*), who places great reliance on the treatment by emetics. In a report, made by Dr. Klapp, he states, that "of 51 cases, all but one were cured without the use of a grain of opium, or a drop of alcoholic drink of any description;—the unsuccessful case died of epilepsy."

The observations of an able practitioner, (*Professor Ware*, of

Boston,) so far as they go, are confirmative of the eclectic, and indeed, of the expectant method of treatment. In 29 cases, of 69 observed by him, the treatment, according to Dr. Ware, was expectant, by which, however, he does not mean to imply, that no remedies were administered. "At the commencement of many of them, active measures were employed for a short period. Thus, some were bled; some leeches; to some an emetic was given; several were blistered upon the neck; and all were more or less subjected to the operation of cathartics. Besides these remedies at the outset, various articles were administered in the course of the several cases, but usually of an inefficacious character, or in such doses as probably to have had no influence on the course of the disease. For example, small doses of *sp. æther. nit.*, *liq. ammon. acet.*, *tinct. hyoscyam.*, *ext. conii*, *tinct. humuli*, *tinct. valerian.*, *tinct. assafœtid.*, and various other medicines were administered; but from the amount and efficacy of the substances thus taken, no physician acquainted with their power would, for a moment, suppose them to have had any control over the disease."

The results of the different modes of treatment are thus thrown together in a tabular form. (*Professor Ware.*)

Treatment.	No. of cases.	Bled.	Died.	Recovered.	Complicated with acute disease.
Opium, large doses,	8	0	4	4	1
— small, - -	7	1	2	5	1
Emetics, - - - -	12	1	1	11	2
Bleeding, - - - -	2	2	0	2	0
Eclectic, - - - -	9	5	3	6	7
Quinine, - - - -	1	0	0	1	1
Mercurials, - - -	1	0	0	1	0
Expectant, - - -	29	4	1	28	1
	69	13	11	58	13

It appears from this statement—says Dr. Ware—that of 15 cases, in which opium constituted the principal remedy, 6 died; whilst of 54, in which opium was not used at all, or only incidentally and in small quantities, only 5 died. Still further, if we separate from these 54 the 9 cases in which the treatment was eclectic, and in which the mortality seems to have arisen from the combination of acute disease, we have a remainder of 45 cases, of which only 2 were fatal. Again, if we compare the mortality of those cases in which opium was pushed to the full extent advised by writers on this disease, with those in which no active remedy was employed, we have a mortality of 1 in 2, against a mortality of 1 in 29.

A recent writer, (*Stokes*), in accordance with his views, already referred to, that delirium tremens, occurring after a debauch, consists in gastritis, accompanied by high excitement of the brain and nervous system, whilst another form consists in the sudden suspension of the habitual use of alcoholic liquors, adopts a plan of treatment very different in the two cases; and affirms, that in the

Meath Hospital, the treatment for gastritis has been used, in the first case, with "extraordinary success,"—the most aggravated symptoms of delirium tremens having been subdued by leeches to the epigastrium and iced water; and it was found—in the same institution—that in patients who died under the stimulant treatment, inflammation existed either in the stomach, or in the substance, or membranes of the brain. In the second case, the indication, Dr. Stokes conceives, is to restore the stimulus; and here, he thinks, the ordinary practice of giving brandy, wine, porter, opium, &c. is proper and successful.

The author's views, in regard to these points, have been given already. He may add, however, that caution should be used in regard to the employment of depletion, even where gastritis really exists; for such subjects rarely bear much reduction.

Under the great impressibility of the nervous system, induced by delirium tremens, the effects of the new impressions made by the operations of the animal magnetizer have been, in rare cases, successful in inducing sleep.

In a case, which occurred in the author's clinique, at the Philadelphia Hospital, in a female patient, who had not slept for four successive nights, and had taken, in all, equal to eighteen grains of opium since her admission, but none for the sixteen hours previously, it occurred to the resident physician, (*Vedder*, of Schenectady,) to test "animal magnetism," as it is termed, as a therapeutical agent. The usual passes and manipulations were accordingly practised, in the presence of Dr. Taylor, of Philadelphia, another of the resident physicians, and the keeper. At the time, the patient was as wakeful as she had been at any time previously. Her thumbs were grasped, as she was lying in bed, and a few "passes" were subsequently made, and in three minutes, to the surprise of the gentlemen, she was in a sound sleep, as evinced by snoring, and diminished frequency of respiration, both of which were carefully noted. She could be aroused when spoken to in a loud tone,—starting suddenly, but falling asleep again. She slept until 12½ o'clock, four hours and a half, and awoke spontaneously. At 10½ o'clock, her hand was placed near her forehead, but not so as to touch it, and it remained in this constrained position until she awoke. A short time afterwards, sleep was again produced, after holding her thumbs for one minute and three quarters, and she slept for three hours and a half. Her pulse, whilst awake, was 84, but it soon fell to 60 when she was asleep. The number of respirations suffered a corresponding diminution, but they were fuller. It may be remarked, that this patient was thrown into a complete state of catalepsy, during this artificial sleep, in which she was seen by the author. Her limbs, when placed in any position, retained it. Her lower extremities were raised from the bed at an angle of about 30° with the plane, and in this position they remained for ten minutes, supporting, at the same time, the weight of the bed-clothes.

They would have remained in this position longer, but it was not considered prudent.

It was afterwards discovered, that it was not necessary to touch her person to produce sleep, and that it could be done in less than a minute by simply looking at her. She was put to sleep by several of the resident physicians, who were witnesses to many of the experiments.

Similar attempts were made on two female patients, labouring under the same disease, but the success was very imperfect. (See the author's *American Medical Intelligencer*, for Feb. 1, 1839, p. 331.)

Throughout the course of the disease, light nourishment, as arrowroot, sago and tapioca, with or without milk, and occasionally a little wine or brandy, may be allowed. Often, however, there is little or no appetite; but still the patient should be encouraged to take a moderate quantity of aliment. During the convalescence, it may be advisable to administer gentle tonics, as any of the bitter infusions, with the view of restoring the tone of the stomach.

XVII. MENTAL ALIENATION.

SYNON. Alienatio Mentis, Ecphronia, Deliria, Vesaniæ, Unsoundness of mind, Insanity, Mental derangement, Deranged intellect, Craziness; *Fr.* Folie, Egarement d'esprit, Aliénation mentale.

Definitions of mental alienation have often been attempted, but it is not easy to give any one, that is entirely satisfactory. (*Haslam.*) We usually understand by it, in the general or abstract signification, a continued or intermittent derangement of the intellectual and moral faculties, commonly unattended with fever. The absence of fever has, indeed, been made by some a characteristic,—*delirium cum febre* being employed to designate the derangement or incoherency, which is noticed with febrile exaltation of the system; and *delirium sine febre* for the derangement now under consideration.

The divisions of mental alienation have caused equal difficulty, and one, which is to be deplored, inasmuch as it prevents those accurate statistical comparisons, which are so desirable. Most of the French writers, however, adopt the same divisions, and it is, therefore, advisable to follow them, even if some objections may apply to them.

Mental alienation may consist either in perversion, or in impairment, or loss of the intellectual and moral faculties. Under the *first* of these conditions may be reckoned, 1. *Mania*, in which the intellect is completely perverted on all subjects. 2. *Monomania*, or partial insanity, in which the perversion is restricted to one subject; and 3d, *Moral insanity*, which consists in a morbid perversion of the natural feelings, affections, inclinations, temper, habits, moral disposition, and natural impulses, without any remarkable disorder or defect of the intellect or knowing and reasoning facul-

ties, and particularly without any insane illusion or hallucination. (*Prichard.*)

Under the *second* may be comprised: 1. *Dementia*, in which the intellect has been impaired or destroyed; and 2, *Idiocy*, where the privation is congenital or has existed from birth.

1. *Mental alienation, consisting in perversion of the intellectual and moral faculties.*

Diagnosis.—This form of mental alienation usually commences with some strange aberrations in the tastes, notions and actions, of the individual, which are different from those of other persons, and of himself when of sound mind. These may continue for a longer or shorter period; after which the disease becomes rapidly formed, and soon attains its full characteristics. The strangest hallucinations are experienced; the patient sees objects, that have no existence, except in his imagination; and equal illusions are experienced in the senses of hearing, smell, and taste; whilst the ordinary effects of irritants and of narcotics are not felt by him. He will remain in the cold until his limbs are gangrenous, and fast for an incredible period without uttering any complaint. It is a common remark, that cold has not the same influence upon the organic actions of the sane and the insane; but this would appear to be an error. The physical effects are identical, but the organ, by which all perception is received, being in a state of exaltation, and employed in its own disordered acts, the usual painful sensations are not experienced.

At times, reason entirely forsakes her seat, and the insane talk incessantly, and incoherently, and in the most excited manner; at others, they reason accurately on all subjects except one, and the greatest ingenuity is occasionally necessary to touch the chord which vibrates so injuriously, and excites the insane delirium; but the moment it is touched the delusion is manifested. In the language of the poet:—

“It may be a sound,
A tone of music, summer’s eve or spring,
A flower, the wind, the ocean which shall wound,
Striking the electric chain wherewith they’re darkly bound.”

However perverted may be the reasoning faculties, the insane generally recollect past transactions and occurrences; but their affections for their former associates and relations are usually much changed, and it is a common occurrence for them to look with the darkest suspicion, and entertain the greatest hatred, towards their nearest connexions.

Their feelings and actions are, indeed, of the strangest character; some are gay, timid, wild, frank, and humble; others are sober, dull, passionate, cunning, mischievous and haughty; whilst others, again, have an irresistible propensity to destroy themselves, their fellow-creatures, or the objects surrounding them; or are engrossed with melancholic, religious, erotic, or other form of monomania.

The expression of the face usually depicts vividly the predominant emotion. When under powerful excitement, the face is flushed, the eyes are widely open, and sparkling; the temporal and carotid arteries beat forcibly, and the voice is loud and clear; at other times, on the contrary, the face is pale, the expression is one of tranquillity, and the voice is weak. Sleep is indulged but little; and is generally disturbed and not refreshing.

It has been already remarked, that the insane delirium is distinguished from the febrile by the absence of disordered organic actions in the former. Whilst the insane delirium is at its height, the nutritive functions may be well executed, the appetite good, and the digestion easy. (*Rostan.*)

In *Mania*—*Ecphronia mania*, *Delirium maniacum*, *D. mania*, *Vesania mania*, *Furor*; Fr. *Manie*; Ger. *Manie*, *Wuth*, *Raserei*,—the mental perversion is general and excited. Hence, it has been termed *raving madness*. When its highest pitch is attained speedily, it is termed *acute mania*: when more tardily and the disease has been of protracted duration, it is called *chronic mania*.

In *Monomania* or *melancholia*,—*Ecphronia melancholia*, *Melancholia*, *Mania melancholia*, *Lypemania*; Fr. *Mélancolie*, *Monomanie*; Ger. *Melancholie*, *Schweremuth*, *Trübsinn*,—that is, in cases of insanity where the insane delirium concerns but one idea or but few, epithets have been assigned to characterize the variety. In *ambitious melancholy* or *monomania*, the patient believes himself a king or some exalted personage; in the *erotic* form, he adores some imaginary or real being; in the *religious*, he is perpetually praying; in the *demonomaniacal*, in constant dread of punishment hereafter; and in the *misanthropic*, in hatred of his fellow men.

Moral insanity has been described as a form of mental derangement, consisting in a morbid perversion of the feelings, affections and active powers, without any illusion or erroneous conviction impressed upon the understanding, and sometimes coexisting with an apparently unimpaired state of the intellectual faculties. The symptoms of this form may consist in singularity, waywardness and eccentricity of character, fickleness and capriciousness of conduct; tendency to gloom and sadness or to preternatural excitement, and to unusual prevalence of angry and malicious feelings; to a propensity to commit every species of mischief, and to theft. The *Delirium senile* or “senile insanity,” in which the whole moral character of the individual is changed, is a variety of this form. (*Prichard.*)

2. Of Mental Alienation, consisting in impairment or loss of the intellectual and moral faculties.

a. *Dementia*, *Amentia*, *Anæa*, *Fatuitas imbecillitas*, *Moria demens*; Fr. *Démence*; Ger. *Blödsinn*. This form of imbecility occurs in the course of life, and, in this respect, differs from idiocy. It may supervene on mania or melancholy, or may make its first

appearance in old age, constituting *dotage*. It is characterized by total incoherence of ideas, and absence of all faculty of reflection,—the brain, in confirmed cases, having lost even the power of appreciating correctly impressions from without. All recollection of the past is commonly lost, although, at times, the loss is confined to recent occurrences, whilst the events of former days are vividly recalled. In deep dementia, however, every intellectual and moral manifestation is gone, so that the individual has no feeling for the past, present or future; and he drags on a vegetative existence of the most helpless and deplorable character. Occasionally, the animal feelings persist, and he laughs or cries without any obvious cause.

Dementia generally takes place progressively, and is usually preceded by furious mania; at other times, however, the sinking or subsidence of the faculties is gradual.

b. *Idiocy, Idiotismus, Moria demens antea*; Fr. *Idiotie*; Ger. *Blödsinn*. This form of imbecility differs chiefly from dementia in being *de nativitate*. It may exist in various degrees, and is dependent upon imperfect organization of the encephalon. The symptoms that mark fully developed idiocy cannot readily be mistaken. The physiognomy is sufficiently characteristic;—a vacant stare of the eyes; the mouth open, and, at times, salivating; with imperfectly developed head, attract the attention even of the unprofessional; and these traits are usually accompanied by great hebetude of memory; faulty articulation, and even utter impracticability of learning, or pronouncing a single word; intelligence so feeble, that the most simple ideas can scarcely be laid hold of; and, at times, total loss of comprehension. These are amongst the chief characteristics of this deplorable state. The degree to which the power of speech exists has been regarded as a measure of the intelligence. Where the powers of the brain are so feeble, that the words addressed to them cannot be appreciated so as to be repeated, the idiocy is extreme; but where the powers are greater, the facility for spoken language will be increased, and may, therefore, afford a criterion of the degree to which the imbecility exists.

Although the intellectual part of the idiot may be thus defective, his animal propensities—particularly those that are developed at puberty—being uncontrolled by reason, are often displayed most offensively. He is filthy, and requires constant attention. Occasionally, amidst the absence of other faculties, the memory is good, or a talent for music, or some other faculty, may be exhibited to such a degree as to excite astonishment. (*Prichard*.)

The insane are liable to a kind of *general paralysis*, which is often observed in the advanced stages of insanity, and especially in cases which are passing or have already passed into dementia, and is ascribed to chronic inflammation of the circumference of the brain. (*Calmeil*.) It is more frequent in men than in women. (*Esquirol*.) Its first symptom is usually impaired action of the tongue, causing the articulation to become difficult. The muscles

of the legs are then affected, so that the gait is unsteady. Thus far, the upper extremities and the sensibility are unaffected; but, in the course of some months, the disease proceeds, until the patient is unable to remain erect; he is compelled to be seated, or in the horizontal posture,—gangrenous eschars forming on the parts that are subjected to pressure;—until he sinks under supervening irritation in the lungs, alimentary canal, or other organs.

The mean duration of the paralysis is said to be 13 months. (*Calmeil*.) It rarely happens, that the paralytic insane recover. One of the most experienced observers (*Esquirol*) has been able to cite only three cases of cure.

Causes of mental alienation.—There is no doubt that a constitutional predisposition to insanity may exist, which is either hereditary or original, inasmuch as the application of the same exciting causes to others, not possessed of such a predisposition, does not induce the disease. It would appear, that persons born before their parents had become insane, are less subject to insanity than those who are born after the disease has exhibited itself. (*Esquirol*.) Where such hereditary predisposition exists, the disease is apt to appear in different individuals of a family at a particular period of life.

There are some strange but rare cases, which would seem to show that a powerful emotion experienced by the mother during utero-gestation has affected the child, and predisposed it to mental alienation at the period of puberty. (*Andral*.)

Statistical inquiries have shown, that in France, the number of insane women to that of insane men is as 14 to 11. (*Esquirol*.) In Italy, on the other hand, the ratio of insane men to that of insane women, is as 5718 to 5067. In Holland, again, the ratio is as 29 to 34. (*Guislain*.) In Great Britain and Ireland, as 13 to 12; and in this country, it has been estimated as 2 to 1. Taking the results of inquiries in various parts of the civilized world, it would not seem that there is much difference between the sexes. Of 76,526 cases, enumerated with this view, 37,825 were males, and 38,701 females,—the ratio of males to females being thus as 37 to 38 nearly.

Mental imbecility is common before the age of puberty; but mental perversion is rare. It would seem from calculations, that the ages, at which insanity is most frequent, are between 30 and 40; next, between 20 and 30; and lastly, between 40 and 60. (*Georget*.) The proportional number of females attacked before their 20th and after their 50th year, is greater than that of males. (*Esquirol*.)

It would appear that the admission of the insane into different hospitals, in England and France, took place at the following ages. (*Georget*.)

Number.	Ages.
356	from 10 to 20 years.
1106	“ 20 to 30 “
1416	“ 30 to 40 “

861	from 40 to 50 years.
461	" 50 to 60 "
174	" 60 to 70 "
35	above 70 "

It must, however, be remarked, that 1416, attacked with insanity, between 30 and 40 years of age, is a smaller proportional number than 174 between 60 and 70; as the number of persons living at the former age is so much greater than at the latter; and, indeed, careful examination shows, that the predisposition to mental derangement increases with advancing age, although in an irregular scale. From 70 to 80, the ratio becomes enormous, owing to the frequency of senile dementia. (*Prichard.*)

One of the most formidable of the predispositions is the influence of previous attacks. It has, indeed, happened, that after repeated attacks of insanity, the predisposition has been lost; but, most commonly, the individual, after one attack, is left more liable to the disease than he was previously.

Elevated heat is not only a cause of insanity, but has an injurious effect upon the insane themselves; hence it is, that the summer solstice is proverbially exciting to them. When ideas prevailed in regard to sol-lunar influence on these unfortunates, it was believed, that direct solar agency was exerted, but, the exacerbations, under such circumstances, are now universally ascribed to the proper cause,—the excessive heat and great length of days at that period.

It is a common observation with the army medical officers, that if a recruit be drafted for a torrid region, who is predisposed to insanity, the disease is very apt to be developed there. We can thus understand, that the number of admissions into insane establishments may be greater in summer than in winter; and the well known fact, that the Scirocco, of Italy, has a manifestly prejudicial action upon them. It appears, that there is an old law in the kingdom of Naples, which assigns a different mode of punishment for offences committed during its prevalence. The average frequency of insanity, in the different seasons, has been estimated in the following order:—summer, spring, winter, autumn. (*Andral.*) This applies especially to mania;—monomania and dementia appearing to occur equally in all seasons. In Naples, however, monomania was observed to be more frequent in the month of September. In England, November has been in the worst repute, having been designated, but without any adequate reason, the "hanging month." Statistical inquiries, indeed, negative the vulgar notion.

As regards the termination of the disease, some observers have assigned the greatest number to autumn; and the greatest mortality to December, January and February.

Not many years ago, the belief in the influence exerted by the full moon on the insane was universally credited. From this very belief they were termed *Lunatics*, and the disease *Lunacy*; and the notion has even been incorporated into the legal definition of

insanity. "A lunatic is, indeed, properly one that hath lucid intervals, sometimes enjoying his senses, and sometimes not, and that frequently depending upon the change of the moon." (*Sir W. Blackstone*.) Yet, it has been most unequivocally established by careful and accurate observations in large insane establishments, (*Cox, Haslam, Esquirol, Woodward*, of Worcester, Mass.) that if the light of the full moon be excluded, the patients are not more liable to exacerbations in their disorder at these, than at other, periods. The insane are certainly more agitated at the full of the moon, and so are they at break of day. *Light* is the cause of the increased excitement at both periods. The stimulus of light frightens some lunatics, pleases others, and agitates all. (*Haslam, Esquirol*; see also, the author's *Elements of Hygiène*, p. 160, Philad. 1835.)

A *coup de soleil*, or exposure to the hot rays of the sun, has been assigned as a cause of madness, (*Esquirol*), but it is not a common one. Many of the French soldiers, in the campaign of Egypt, were said to have returned home insane from this cause; but there were other important and disturbing agencies at work in that distant and disastrous expedition. The same occurrence is, indeed, recorded of the campaign in Russia in 1812. (*Andral*.)

Injuries of the head occasionally induce mania, but more frequently encephalitis. When mania does supervene, it is, at times, not until the lapse of several years. Rare cases are on record, in which the intellectual faculties have been brightened by such an accident. A recent writer (*Prichard*) was informed, on good authority, that there was, some time since, not far from Bristol, a family consisting of three boys, who were all esteemed to be idiots. One of them received a severe injury of the head, after which his faculties began to brighten, and he is now a man of good talents, and practises as a barrister. The brothers are still idiotic or imbecile.

Spirituous liquors are a common cause of one form of delirium, already treated of—the delirium tremens; but not, so far as the author has observed, of mental alienation. In this country, where delirium tremens prevails to a great extent, and where a good opportunity exists for noticing the effect of alcohol in inducing insanity, we do not see a great many cases, that can be unhesitatingly referred to it. The fact, too, of the great number of insane among the Society of Friends, who rarely indulge in any form of alcoholic drinks, is—so far as it goes—against the idea of alcohol being an extensive cause of mental alienation.

Yet—it is proper to remark—that in the reports of many public institutions, dram-drinking is presumed to have been a common excitant. In the Massachusetts State Lunatic Asylum, one-fifth of the cases have been attributed to this cause; yet in the Connecticut Retreat for the Insane, of 116 patients, only two are stated, in one of the reports, to have been rendered insane by intemperance, and two others by dissipation, and exhaustion conse-

quent upon dissipation. (*Brigham*, of Hartford.) This last institution receives, however, fewer pauper lunatics than the other.

It is not improbable, that the abuse of alcohol may lay the foundation for insanity in the progeny. It has been observed, indeed, that many insane have been the children of persons, who had indulged largely in the pernicious habit.

Abuse of mercury, has been considered to have induced mental alienation, (*Esquirol*;) but this has been denied by others, (*Cullerier*;) and it has been conceived, that the disease may have been rather owing to abuse of sexual intercourse, and the kind of restless life to which the individual may have been exposed, than to the remedy employed for certain morbid conditions that may have been coexistent. (*Andral*.)

Excessive venery has likewise been regarded, by many writers, as a cause of insanity, and especially of dementia. In the annual reports of most of our lunatic asylums and penitentiaries, many cases are referred to masturbation; but, we are satisfied, the influence of this practice is exaggerated by some of the observers. A recent writer, who has had much experience in insane cases, (*Brigham*, of Hartford,) much doubts, whether masturbation be a frequent cause of insanity. "I am aware," he remarks, "that the insane are frequently seen to practise it, and I know, that in them it has, sometimes at least, most baneful effects, hurrying them to idiocy and death; but generally I regard it as the effect of the disease of the brain, which causes the insanity. A few years since," he adds, "I caused much inquiry upon the subject to be made at the Connecticut state prison. I ascertained, that there was scarcely an instance of a prisoner who did not practise it; many of them had for years, and some of them daily. I have no doubt it is a very common practice among prisoners, yet we seldom hear of one becoming insane from this cause. I never have heard of a single instance." It certainly is a very prevalent vice in our penitentiaries; but, as before observed, its influence in the production of insanity has been, doubtless, greatly exaggerated. (*Millingen*.) At times, indeed, insanity would appear to arise from the mental effort employed to overcome desires that are almost irresistible. Satyriasis in the male, and nymphomania in the female, must be regarded as cases of moral insanity.

Sudden suppression of the catamenia has induced insanity; and, in old cases, the greater impressibility of the female at the menstrual period frequently gives rise to exacerbations of the disorder. A case is recorded of a young girl, who was attacked with insanity at the age of 15, on the first appearance of the catamenia, and who was not cured until the critical time of life. (*Esquirol*.) The same writer refers to the case of a young female, who suddenly exclaimed to her mother, that she was cured; her catamenia had flowed spontaneously, and her restoration to reason was the immediate consequence.

Pregnancy, likewise, exerts an influence. Some women become

insane whenever they are in that condition; and one of the most interesting forms of insanity occurs in the childbed state—*puerperal insanity* or *mania*. Occasionally, mania has followed weaning, and it is one of the consequences of undue lactation. (*Ashwell*.)

Although excessive venery is a cause of mental alienation, the state of celibacy appears equally to favour it,—the number of single insane persons being everywhere greater than that of the married. This result may depend, however, upon moral influences of another character.

Various diseases of the brain may predispose to insanity. Violent mental emotions, misery, and great public calamities, are well known causes. The inhabitants of the country, whose life is more peaceable, and less exposed to excitement, are attacked in smaller number than those of the towns.

The results of all inquiries have shown, that persons in easy circumstances are far less subject to insanity than those who are indigent, and too often irregular in all their habits. The ratio of the insane among the indigent classes in England is surprising. Of 14,000 insane persons in England and Wales, 11,000 are supposed to be indigent. (*Sir A. Halliday*.) In the census of the state of New York, taken in 1835, it is stated, that of 967 lunatics, (that is exclusive of idiots,) 382 were supported by charity, and 312 were able to support themselves—leaving 273 not classified, but who—it is affirmed—were doubtless in indigent circumstances. From estimates, made by the author, as chairman of a committee to draw up a memorial to the legislature to ask for the establishment of an asylum for the insane poor of Pennsylvania, the number of insane at the latter end of the year 1838, was at least 1,600 or 1,800, of whom 600 or 700 were lunatics, and 1,000 or 1,100 idiots; and of these lunatics, it was estimated, that from 400 to 500 might require the assistance which the contemplated charity was to be made capable of affording.

Care and anxiety, passions and emotions, apprehensions relative to salvation, or other religious impressions, if excessive, may be exciting causes of insanity. It has been argued, indeed, that the number of the insane is in a direct ratio with civilization, (*Foville, Brière de Boismont*;) but the medical statistics of countries does not altogether establish this; although there can be no question, that civilized man is more subject to insanity than the savage. From estimates it would appear, that in England, the proportion of the insane to the whole population is 1 in 783; in Wales, 1 in 911; in Scotland, 1 in 573; in the Rhenish provinces, 1 in 1,000; in Norway, 1 in 551; in France, 1 in 1,000; and in Italy, 1 in 3,785: yet M. Foville and Brière de Boismont would scarcely admit, that the people of Norway are more civilized than those of France. The proportion of insane in the large cities has been enumerated as follows:—London, 1 in 200; Paris, 1 in 222; Milan, 1 in 242; Florence, 1 in 338; Turin, 1 in 344; Dresden, 1 in 466; Rome, 1 in

481; Naples, 1 in 791; St. Petersburg, 1 in 3,133; Madrid, 1 in 3,350; and Grand Cairo, 1 in 30,714. (*Brière de Boismont.*)

There is certainly a singular difference between these countries, as there would appear to be between the different states of this Union, in the number of their insane, but the difference is by no means easy of explanation. In New Hampshire, when the population did not exceed 280,000, the number of lunatics was estimated at 600; in Connecticut, in a population of 298,000, at 700; in Massachusetts, with a population of about 612,000, there were 1,000; and in Virginia, taking the population at 1,200,000, it was considered that there were, in 1838, not fewer than from 600 to 800 insane persons. In New York, the ratio in 1835 was considered to be 1 in 887 and a fraction, and the probability is, that it is quite as great in Pennsylvania, where, under the lowest estimate, there are probably, at this time, not fewer than 2,000 lunatic and idiotic, of whom it has been estimated that about 1,200 may be idiots; 800 lunatics.

It has been suggested, (*Esquirol,*) that owing to Norway and Scotland being mountainous countries, idiots are more numerous than in those which are more level,—idiocy or mental *imbecility*, he conceives, being owing to physical circumstances connected with locality, whilst madness or mental *perversion* is the product of society and of intellectual and moral influences. In idiocy, causes have interfered with the development of the organs; in madness, the over-excited brain has transcended its healthy boundaries. But, although locality has, doubtless, its influence in the production of certain forms of insanity, as of other diseased conditions, it is impossible to regard the rule absolute, when we refer to the enumerations of Europe or of this country,—the proportion in Wales, which is extensively mountainous, being small, and that of Italy, traversed by lofty ridges, the least in the table.

One of the most striking instances of idiocy induced by locality is *cretinism*,—a species of fatuity connected with personal deformity, which is well known to exist in the Valois, and in some other parts of Switzerland.

Diseases of the digestive tube likewise give rise to insanity. Most commonly, the form of unsoundness of mind is that of hypochondriasis. Perhaps the cases of living animals in the stomach, which we often meet with, may be connected with some morbid condition of the organ; the gastric suffering being real, but incorrectly appreciated by the brain. (*Andral.*) That the morbid condition cannot, however, be always restricted to the stomach is shown by the fact, that the uneasy feelings assigned to the presence of a living animal in the stomach are often referred to the back, upper extremities, and to other parts, which have no connection with that viscus. These feelings are neuropathic, and inaccurately interpreted.

In other diseases, as in phthisis, the brain remains singularly free, so that the intellect may continue unclouded, until within a short time previous to dissolution.

The author has seen two fatal cases of rheumatic pericarditis which terminated in furious mania not more than 12 hours before dissolution.

Loss of blood and protracted lactation have, likewise, been considered as causes of mania. (*M. Hall.*)

Dementia supervenes, at times, without any very manifest cause. At others, it seems to result from encephalic disease. It certainly is not an uncommon sequela of serious disease of the encephalon, as paralysis, and chronic affections of the brain and its meninges,—epilepsy, and occasionally of chorea.

Pathological characters of mental alienation.—The attention of the best observers has been directed to the brain, with the view of discovering whether there be any pathological lesions to which the derangement in the intellectual and moral manifestations can be referred; and since the time of Morgagni numerous examinations of the dead have been made with this view. They have failed, however, in shedding any steady light on the true nature of insanity. (*Pinel, Esquirol.*) Such, however, is not the opinion of some of the more modern observers, who maintain, that the brain presents alterations, which are susceptible of detection by the pathologist,—that these alterations differ according as the disease is acute or chronic; and with the nature of the symptoms, according as they consist in affections of the intellect or of motility. (*Foville.*)

At one time, insanity has been esteemed a purely nervous disease, and not to be elucidated by pathological investigations; (*Pinel*;) at another, as an affection of the vital forces of the brain, not as an organic disease of that viscus, (*Esquirol*;) at another, of acute—in the first instance—and afterwards of chronic inflammation of the encephalon, (*Gall and Spurzheim*;) at another, of irritation of the encephalon, often induced by disease elsewhere, (*Broussais*;) and at others, again, it has been regarded as an inflammation of the superficial gray matter of the encephalon. (*Foville and Delaye.*) From all his observations, M. Foville is led to infer, that morbid changes in the cortical or gray substance are directly connected with intellectual derangement, whilst those affecting the white substance are directly connected with disorders in the motive powers. (*Foville, Pinel Grandchamp, Calmeil.*)

The appearances in the gray portion of the brain, according to the gentlemen just cited, consist in injection, of a red or deep brown colour, either generally or partially; and in *ramollissement* or softness, so that portions of the encephalon are raised with the meninges when the latter are detached,—the membranes being opaque, and covered with serum, lymph, or pus. The bones, too, have been found, in some cases, thickened and indurated; and, at others, have presented a kind of atrophy, in which the diploe had disappeared, the external plate approaching to the internal in such sort, that a very manifest depression was observed externally.

Still, as we have seen, the necroscopical examinations of other excellent observers have not confirmed those of M. Foville, and

were it even proved, that the appearances enumerated are to be met with on the dissection of the insane, a most important question would arise, whether they can be regarded as the organic cause of the mental perversion, or whether it is not as probable, that they are the effect. If, indeed, it be admitted, that any mental influences can induce encephalitis, it is easy to see, that the same morbid condition may supervene on the excited manifestations of the insane.

In dementia, the morbid appearances have been as follows:—the brain pale and exanguious; the gray substance shading off into the white. The encephalon has been noticed to be decidedly diminished in size, with sinking of the convolutions, and augmented consistence of the encephalic substance; at other times, the substance has been found soft, and the parietes of the cranium thick, the inner table projecting, with augmented space between the tables:—appearances—it will be observed—which can by no means be esteemed distinctive.

In idiocy, the parietes of the skull have likewise been seen thickened, and the encephalon remarkably small; the convolutions small, and the anfractuositities shallow; frequently, a whole lobe of the brain has been found wanting, the destroyed part forming a digital depression, when the sides were brought together; at other times, the portion destroyed is replaced by a cyst containing serum, and these changes have been coincident with paralysis and wasting of the limbs. Induration of the white substance, and traces of encephalitis have also been met with. (*Rostan.*)

In the general paralysis, described as one of the complications of insanity, dissection would seem to have shown, that there is no effusion of blood in the encephalon; but there is acute ramollissement or sanguineous congestion;—a condition which—it has been conceived—is almost always dependent upon chronic inflammation at the periphery of the brain. (*Calmeil.*)

It has been asserted by one observer, (*Meikel,*) that the brain of the insane does not weigh as much as that of the sound individual, but others have arrived at opposite results. (*Leuret, Mitivié.*) These gentlemen found the brains of sane persons to be, on the average, of the specific gravity of 1.028; those of the insane 1.030; of maniacs, 1.031; of those in a state of dementia, 1.032; and of monomaniacs, 1.034;—the mean specific gravity being 1.031.

It has been an interesting inquiry, and one, which it was presumed would shed light on the subject of phrenology—whether there be any correspondence between the shape of the head and the character of the insanity,—whether, in other words, the mapping out of the different organs for the intellectual and moral faculties be confirmed by anything that we notice in special developments in the heads of the insane.

Of the skulls in the collection of M. Esquirol, which were examined by a talented physician, (*Georget,*) one-half presented nothing remarkable; they appeared as regular, and as well-formed,

as in other circumstances of life. The other half presented peculiarities in the form, the regularity of the skull, and in the thickness, the density and the organization of the bones that compose it. Some were unequally developed, one of the sides being larger and more arched than the other, and this was generally the right side. Some were twisted, so that one side of the head was too forward, and the other too much behind. The cavities at the base of the skull likewise presented inequalities; those of one side being at times larger than those of the other.

Lunatics with contracted heads have been observed to pass most readily into a state of dementia, and hence the frequent occurrence of such a shaped head in dementia.

On this subject, the opinions of an eminent writer on mental diseases, (*Prichard*,) are forcibly expressed, and they are cited here, because they accord closely with the results of the author's own observations.

"I have taken every opportunity that has occurred to me for many years of making inquiries of persons who had a great field of observation within their reach, what had been the result of their experience on this subject. Many of these persons have been physicians, who were physicians of extensive lunatic establishments. Some of them have been men who had addicted themselves to the study of phrenology, and were predisposed to imbibe the opinions of its authors; some have been persons distinguished by their researches in the anatomy and physiology of the brain and nervous system. Among them I do not remember to have found one who could say that his own observation had afforded any evidence favourable to the doctrine. Yet we should imagine that a man who lives amidst hundreds of monomaniacs must have constantly before his eyes facts so obvious that he could not be mistaken in their bearing. Some hundreds and even thousands of such persons have passed a part of their lives under the inspection of M. Esquirol, who possesses most extensive resources for elucidating almost every subject connected with the history of mental diseases, and has neglected no inquiry, which could further the attainment of that object. The result of his observations will be allowed to be of some weight in the decision of this question; in which the appeal is principally to facts of the precise description of those with which he has been chiefly conversant. At his establishment at Ivry, he has a large assemblage of crania and casts from the heads of lunatics, collected by him during the long course of his attendance at the Salpêtrière and at the Royal Hospital at Charentin, which is under his superintendence. While inspecting this collection, I was assured by M. Esquirol, that the testimony of his experience is entirely adverse to the doctrine of the phrenologists; it has convinced him, that there is no foundation whatever in facts for the system of correspondences which they lay down between given measurements of the head and the existence of particular endowments. This observation by M. Esquirol was made in the

presence of M. Mitivié, physician to the Salpêtrière, and received his assent and confirmation. M. Foville, physician to the extensive lunatic asylum at St. Yon, gave me a similar assurance. There are few individuals in Europe whose sphere of observation has been so extensive as that of M. Esquirol and M. Foville, and certainly there are none whose science and habits of observation better qualify them to be witnesses in such a subject of inquiry; but testimonies to the same result may be collected from unbiassed witnesses, whose evidence taken collectively may have nearly equal weight. Among these are men unscientific, though capable of correct and unprejudiced observation, as well as anatomists and physiologists. In the number of this latter is Rudolphi, who declares that he has examined many hundreds of brains without finding anything that appeared to him favourable to the phrenological theory."

Treatment.—In the earlier ages, when sound philosophy was but little cultivated, and every infliction of the kind now under consideration was esteemed one of the most awful dispensations of the Almighty, it was believed to set at defiance all attempts at explanation, and the best directed efforts for its removal. Modern science and philanthropy have, however, afforded the most signal evidence of the inaccuracy of the ideas of our ancestors in relation to the curability of this disease.

The experience of the insane institutions of the United States has been highly encouraging. In the asylum for poor lunatics at Worcester, Massachusetts, of the patients admitted during the year ending Nov. 30, 1835, whose insanity was of less than 12 months' duration, the recoveries were $82\frac{1}{2}$ per cent.; and of the old cases, for the same time, only $15\frac{1}{2}$ per cent. A more recent report of this asylum, exhibits results still more gratifying. During the year 1839, there were admitted 418 cases of duration less than one year; of these there were discharged recovered, 340 cases, which is $81\frac{1}{3}$ per cent. The deaths of recent cases being deducted, the percentage will be $84\frac{2}{3}$; "and if,"—adds the superintendant, (*Woodward*, of Worcester, Mass.) "the recent cases, now in the hospital, which are convalescing or have been recently admitted, all of which have had insufficient trials, are deducted, the per cent. will be $92\frac{2}{3}$. Of all the patients, that have been in the hospital, the recoveries have been 41 per cent."

In the McLean asylum, at Charlestown, in the same state, the ratio of recoveries in recent cases,—that is, of those not over one year's standing,—was, in 1837, $86\frac{1}{2}$ per cent.; and of old cases, 38 per cent.

It is important to bear in mind the immense difference in the curability of insanity in recent and in chronic cases, which has been equally observed in other institutions than those mentioned, although not always in the same ratio. At the York West Riding asylum, of 318 cases that had existed from one to thirty years, only 26 were cured. (*Sir W. Ellis*.) Of 173 old cases, in the Bloomingdale

asylum, New-York, in 1835, only 16 were restored; and it has been asserted from accurate observation in some of the large insane establishments of France, that after the disease has passed the third year of duration, the probability of cure is scarcely more than 1 in 30. (*Esquirol*.) M. Esquirol's conclusions are, that the greatest number of cures is effected in the first two years;—that the mean term of cure is a little less than a year;—and that after the third year, as before remarked, the probability of cure is scarcely more than 1 in 30.

But although the ratio of cures diminishes so largely as the disease is more protracted, no case ought to be adjudged desperate. Many cases are recorded—and still more have not been recorded—of persons who have been esteemed incurably insane, and who have, notwithstanding, been restored to the full possession of their intelligence. A case is on record of a lady, who had passed 25 years in a state of mania, and who suddenly recovered her reason (*Pinel*;) and another of a young girl, who had been fourteen years in a state of dementia, and who, one morning, on rising, ran and embraced her mother, calling out, "Oh! mamma, I am cured!" (*Esquirol*.) The same distinguished observer states, that whilst he was at La Salpêtrière, a woman, who had been insane from the period of puberty, was suddenly restored at the age of 42—the critical period.

Treatment.—The treatment of insanity may be divided into the *therapeutical* and the *moral*.

1. *Therapeutical treatment*.—The difficulty that exists in comprehending the precise pathological condition of the brain in insanity throws much obscurity on the treatment appropriate to even furious cases of mania. Still more obscurity must rest on the therapeutical management of those cases in which the disease has existed for any length of time. In these last cases, indeed, the efforts of the physician have to be mainly restricted to the adoption of moral means.

The most philosophical plan is to meet the pathological conditions as they arise; and, at the commencement of mania, when the patient is young and vigorous, with redness of face, strong and frequent pulse, and signs of cerebral hyperæmia or inflammation,—as well as in the course of the disease, should similar symptoms supervene,—general blood-letting may be employed with much advantage, and be pushed to such an extent as to decidedly affect the system. In the latter cases, the blood may be drawn by cupping or leeching on the temples or the nape of the neck. Many of the French practitioners advise the application of leeches revulsively to the anus or the thighs. The opinion has been advanced, that the evacuation of blood ought to be carried to a greater extent in madness than in any other acute disease whatever. (*Rush*.) From a patient, 68 years of age, Dr. Rush caused 200 ounces of blood to be drawn, in less than two months. From another patient he took 470 ounces in the course of seven months, by forty-seven

bleedings. This practice has, at the present day, few—if any—advocates; and there are even some, who maintain, that bleeding of all kinds should be proscribed, (*W. A. F. Browne*;) but the course, above recommended, has been found—by the author—the most satisfactory. He has not bled because a patient was maniacal, but because the symptoms appeared to him to call for it. The same may be said of the recommendation, that bleeding should be practised on female lunatics at each menstrual period, whether the catamenia flow or not. (*Andral*.) An indiscriminate course of this kind might be very prejudicial; the cause of the exacerbations being, under such circumstances, inordinate nervous impressibility rather than high vascular excitement.

It may be stated, moreover, as a remarkable fact, that in the Gloucester Lunatic Asylum, England, under the superintendence of Dr. Shute and Mr. Hitch, the use of the lancet, leeches, cupping glasses, blisters, drastic purgatives, and the practice of shaving the head are totally proscribed; and yet recoveries take place in a large proportion, and no cases of sudden apoplexy or hemiplegia have occurred. (*Prichard*.)

In cases where the organic actions are unusually excited, the head may be shaved—which of itself frequently tranquillizes—and ice may be applied in a bladder. In very severe cases, in addition to this, it has been advised to immerse the patient in a warm bath, twice or thrice a day, and for two or three hours at a time. (*Foville*.) Whenever the heat of the head is very great, the use of cold water or of ice may be employed with advantage.

The new impressions, produced by the cold shower-bath or douche, or by the cold affusion to the surface, have been thought serviceable by many, (*Rush, Esquirol, Foville*;) but by others the first of these meets with but little favour. (*Andral*.) The douche is certainly one of the very best tranquillizers that can be employed. A column of water of the size of the arm, or even less, made to fall from a height on the head of the furious maniac, will almost always tame him. One of the most frantic cases, that ever fell under the author's care, was tranquillized by the column proceeding from the spout of an ordinary teapot, made to fall upon the head from the elevation of a few feet. The case of a young girl is related, who was placed in a bathing-tub with a garment over her, and water at 57° Fahrenheit was poured in small quantities on her head, till it covered her body, and shivering was induced. On repeating the application, tranquillity followed. On one occasion, violent shivering supervened on its use, when the patient was immediately put to bed, fell asleep, and copious perspiration ensued. On awaking, she was entirely tranquil, and her intelligence wholly restored. (*Foville*.)

It is scarcely necessary to say, that these severe shocks are inapplicable in cases where the constitution is much enfeebled; and, in old cases, attended with a disposition to hyperæmia of the encephalon, their use has been esteemed questionable, owing to the

danger of inducing paralysis, (*Prichard*;) but it does not appear, that any such results have actually occurred. In these very cases, and, indeed, in all, warm bathing forms an excellent remedy, but it must be *warm* (about 91°), not *hot* (98° and upwards): the latter could scarcely fail to add to the vascular excitement.

As the revulsion induced by cold bathing is found serviceable, so may the different forms of revellents be prescribed with advantage in mental alienation. Blisters have been applied to the nape of the neck, or to the shaved head—the former being preferable; issues or setons have been placed on the neck; caustics and the actual cautery have been applied to the same part, or to the crown of the head; as well as counter-irritant lotions and ointments; and there are cases, which are adapted for their use; but the benefit derived from them, in ordinary maniacal cases, has not generally been striking, in the author's experience, and in this respect, he finds it accord with that of others. He has seen cases of monomania, however, in which the individual was sunk in a state of torpor and lethargy, where good results manifestly followed the employment of a blister to the nape of the neck, and of the moxa to the temples.

The actual cautery, applied over the syncipital region, was highly extolled by a veteran practitioner, (*Valentin*;) but it has given rise to unpleasant consequences. (*Andral*.) When applied to the nape of the neck, the effect—as might be presumed—was better. It was remarked, that whenever the patient experienced neither terror nor pain during the operation, it failed to produce benefit. In such a case, the alienation must, indeed, be extreme, and almost, if not wholly, hopeless. In the same cases, an ammoniacal paste has been advised. (*Gondret*.) It acts in the same manner as the revellents already mentioned.

The *Pommade ammoniacale* of Gondret is made by uniting two parts of *liquid ammonia*, with one part of *suet*, and one of *oil of sweet almonds*.

Amongst the revellents that are profitable in mania, cathartics have long held a conspicuous rank. The hellebore of Anticyra—now no longer used—exerted its remedial agency in this way. The practitioner must use his discretion as to the administration of cathartics. There are but few cases, however, of recent insanity, in which a brisk cathartic, given twice a week, may not be of service. Any of the ordinary cathartics may be prescribed—as jalap and calomel; rhubarb and calomel; sulphate of magnesia and senna, &c.; but if the patient be refractory, he may be deceived by mixing calomel with butter; or a few drops of croton oil with honey.

Emetics act, like cathartics, as revellents, and they have been employed by some practitioners in all cases of insanity. Where there is much tendency to encephalic hyperæmia, they should be given with caution, or not at all, as encephalic hemorrhage, it is asserted, has supervened on their use. (*Haslam*.) But where much torpor exists, and it is desirable to excite a new action, they may be given with positive benefit. (*Esquirol*, *Professor*

Rush, of Philadelphia, *Foville*). The author has found much advantage from them in those cases. On the other hand, whilst it has been maintained, that their employment may be of use in cases of insanity, accompanied with disorder of the stomach, it has been affirmed, that after the administration of many thousand emetics to persons who were insane, but otherwise in good health, no benefit whatever was derived from them. (*Haslam*.) It must be borne in mind, that here, as in the case of all remedies given to the insane, the dose must be large; and no better form can be given, than the ordinary combination of tartarized antimony and ipecacuanha.

R.—Antim. et potass. tartrat. gr. vj.

Pulv. ipecacuanhæ, ℥ij.—M. et divide in pulv. ij.

One to be taken, and, if emesis does not follow in 20 minutes, the other.

When emetics are given as nauseants, the state of sedation, thus induced, is beneficial in the very cases in which full vomiting might be prejudicial, and is less adapted for those cases in which it has been seen that full emesis may be induced with benefit.

To the same class of therapeutical agents may be referred rotatory motion, which was recommended in ancient times, and has been revived in our own day. It is applied by the rotatory chair, or the rotatory swing, and by the effect it induces on the encephalon, and, through it, on the function of circulation, it produces a decidedly sedative agency, and may be had recourse to with advantage in the cases, referred to above, in which sedatives are proper. It is, also, one of the most effectual means of restraint in furious mania. (*Darwin, Cox, Prichard*.)

Mercury, also, belongs to the class of revellents. It was highly extolled by a distinguished physician of this country, (*Professor Rush*, of Philadelphia;) but it is rarely employed. He pushed it so far as to affect the system.

In a disease, characterized by so much excitement of the animal functions, agents, that were calculated to act more especially on those functions, were naturally had recourse to. Opium was accordingly prescribed in large doses, and by some it has been highly extolled. (*Brigham*, of Hartford; *Woodward*, of Worcester.) The author has administered it in long protracted sleeplessness, and, at times, with decided benefit. It requires, however, to be given in large doses—at least two and a half or three grains in the form of pill; and this dose may be repeated should it be necessary. It has been asserted, that cerebral congestion has resulted—in those predisposed to it—from “a moderate dose of opium.” (*Prichard*.) This might be the case: a small dose of opium differs, indeed, as much from a large dose, as any unquestioned stimulant does from an equally unquestioned sedative; and it is a dose capable of inducing sedation that is indicated in mania.

Other narcotics—and especially hyoscyamus, stramonium and belladonna—have been substituted for opium, but they are not as effective hypnotics as the latter, which may be given in substance or in the form of the acetate, sulphate, or muriate of morphia,

which are, with some, devoid of the exciting qualities that opium itself possesses.

Camphor has been recommended by many, (*Hufeland, Perfect*), but no confidence is, at the present day, reposed in it. This, indeed, is what might have been anticipated. It was, at one time, supposed to be possessed of powerful narcotic properties even in small doses, but at the present day the supposition is generally regarded to be entirely gratuitous.

Lastly,—digitalis, from its action on the sanguiferous system, has been thought adapted to cases of high maniacal excitement, and it has been much given on the European continent and in Great Britain,—pushed to the extent of inducing vomiting.

R.—Tinct. digital. gtt. xlv.
Syrup. papaveris, ℥iss.
Aquæ, ℥iv.—M.
Dose, a third part, three times a day.

Or, R.—Pulv. digital. gr. xvij.
—glycyrrhiz. ℥ss.
Syrup. q. s. ut fiat massa in pil.
xij. dividenda.
Dose, one, three times a day.

It is adapted for cases, in which there is, at the same time, hypertrophy of the heart; but on the insanity itself it has rarely, if ever, exerted any beneficial agency. (*Andral*.)

In cases of intermittent insanity, the cinchona or the salts of its active principles have been recommended; but these remedies has not been observed to have the same effect as in other intermittent affections. The author has never met with such a case; but, at times, in long protracted insanity, it may become advisable to support the flagging powers of life by the different tonic agents, aided by an appropriately nutritious diet. In such cases, the cold infusion of cinchona, or compound infusion of gentian, are calculated to effect all that any of the agents of the class of tonics can accomplish.

R.—Infus. cinchon. sine calore præ-
parat. ℥ijss.
Tinct. cinchon. ℥ij.
Syrup. aurant. ℥ij.—M.
Dose, one third, three times a day.

Or, R.—Infus. gentian. comp. ℥iv.
Syrup. aurant. ℥ij.—M.
Dose, one third, three times a day.

As regards the general paralysis, which supervenes on mania, no treatment promises success. If the counter-irritants, already mentioned, will not effect improvement, none is to be expected from any other agency.

It is scarcely necessary to say, that, throughout the whole disease, attention must be paid to the general health, and to the treatment of coëxistent affections; on which, indeed,—as has been shown,—the mental aberration may occasionally be dependent. With many practitioners, the physical or therapeutical treatment is restricted to this. The arrest of accustomed secretions—as of the catamenia, and hemorrhoidal flux—as well as the disappearance of cutaneous eruptions, having been esteemed causes of insanity, the discharges must be restored if practicable, especially should there be any good reason to believe, that the encephalic disturbance has arisen therefrom. A case is related, in which paralysis became

complicated with madness in consequence of the suppression of an habitual hemorrhoidal discharge, and in which the application of a single leech to the hemorrhoids every day, for a month, was followed by a restoration of the flux, and the patient was cured. (*Foville.*)

Having no true emmenagogue, our remedial efforts, in cases of amenorrhœa must be guided by the pathological condition, which appears to have given rise to the suppression; and if we fail in restoring it, benefit may at times be produced from the topical loss of blood by leeches applied to the interior of the thighs or by cupping on the loins, conjoined with the use of pediluvia and semicupia. These baths may be made exciting by the addition of salt or the flour of mustard.

2. *Moral treatment.*—In all cases of mania, it becomes necessary to adopt a system of appropriate seclusion or separation. It is now the universal sentiment among the informed, that no case of insanity can be as satisfactorily treated in a private house, no matter how well regulated it may be, as in institutions established for the purpose. The author well recollects, how forcibly this conviction was impressed upon his mind by the *fatal* consequences of inevitable neglect, during the severity of winter, in a case, which was attempted to be treated at home, under the double impression, on the part of the family, that the ordinary servants of the house would be able to attend to the sufferer, and that there was something revolting in sending a relative to a public institution, where neglect was *possible*, and where he would be deprived of those cares, which relatives—it is too often erroneously conceived—are alone able to bestow.

There may be cases, indeed, in which the patient is attached to those about him, and has reason sufficient to prevent him from doing violence to any one. In such cases, much doubt may exist as to the propriety of removing him from home; but in the immense majority of cases, the maniac detests his nearest and dearest friends, and it becomes essential, both in respect to his recovery, and the safety of others, that he should be placed in proper confinement. In all cases, however, both of mania and monomania, regard must be had to the manifestations, in deciding—not only whether the patient shall be permitted to be at large, but whether total seclusion affords the best prospect of cure to the sufferer, and of safety to those around him.

In every well regulated insane establishment, attention is paid to proper classification; the furious are always separated from the more peaceable; and the convalescents are allowed a quarter of their own. The very violent may be subjected to total seclusion, and can, in general, be tamed by the strait jacket, which, however, ought to be employed as rarely as possible, and by the douche; and as soon as the state of violence has subsided, the restraints may be removed, every care being taken to anticipate a return.

For the banishment of chains, and for the modern salutary re-

forms in the moral management of the insane, humanity is mainly indebted to a distinguished philanthropist and physician of France, (*Pinel*), who, about fifty years ago, had the hardihood to oppose the revolting management at that time universally in use in the insane institutions of Paris, and whose boldness, judgment, and philanthropy were crowned with a degree of success, which must have been as gratifying as it was astonishing to him.

During the stormy times of the French revolution, in 1792, *Pinel* made the experiment, which has gone as far as any single circumstance to render his name celebrated amongst physicians, and amongst the benefactors of his race. In the course of a few days, he removed the shackles from fifty-three lunatics confined in the Bicêtre. An unexpected improvement followed from a course previously thought impracticable, and even fatal. The furious maniacs, who monthly destroyed hundreds of wooden utensils, renounced their habits of violence; others, who tore their clothes, and rioted in filth and nudity, became clean and decent; tranquillity and harmony succeeded to tumult and disorder; and, over the whole establishment, order and good feeling reigned. (*Scipion Pinel*.)

It is now well established, that the insane should never be harshly treated: firmness and a perfect absence of everything like temper, on the part of the attendant, are indispensable, and rarely fail in tranquillizing the most furious and malevolent. In all cases of danger to themselves or others, the maniac and the monomaniac must be carefully guarded, and should never be trusted out of the sight of the keeper.

Recently, it has been proposed and practised, to totally abolish all personal restraint in the management of the insane, and it is said to have been entirely effective. The plan is to substitute a most rigid system of constant superintendence, of well preserved classification, and of humane and effective practical management. (*Charlesworth, Hill, Prichard, Conolly*.) It has been affirmed, indeed, (*Hill*), "that in a properly constructed building, with a sufficient number of suitable attendants, restraint is never necessary, never justifiable, and always injurious in all cases of lunacy whatever." Cases, in which the patients render their clothes and persons filthy, present considerable difficulty, but in such cases, a warm bath is always ready, into which the patient is put, and well washed, and the clothes are changed as often as becomes necessary. In violent cases, the patient is at times placed alone, in a room well aired and lighted, where there is nothing destructible, and is treated with all the kindness that can be bestowed upon him.

Admitting, however, the practicability and efficiency of the system of non-restraint in a large mass of cases, it may be questionable, whether it be of universal application; and were it so, it can rarely happen, that establishments for the insane are so well provided with competent attendants, that corporeal restraint can be wholly dispensed with. The experience, however, of the large insane institutions of this country has sufficiently shown, that it can be but

seldom necessary. In a late annual report of the State Lunatic Asylum, at Worcester, the managers affirm, that chains have never been thought of, and the strait waistcoat or jacket has never been used; and the same remark, as to the strait waistcoat, is made by the directors of the Ohio Lunatic Asylum, in one of their annual reports. "If the patient," they observe, "is received in a furious state, he is placed in a lodge appropriated to such cases; or, if one is seized with a paroxysm of mania in the wards, he is immediately removed until the paroxysm subsides, and then returned to his former situation." "Such," they add, "is the effect of the system of treatment adopted here, that in the halls where from eighteen to twenty are admitted together during the day, no noise or violence exists, and with those, who a few weeks or days since were beyond ordinary control, order, peace, and decency of manner and language now prevail.

In the Bloomingdale Asylum, New York, it is affirmed, "it is long since there has been such a thing as a strait jacket in the establishment."

In every well arranged establishment, the sexes are kept entirely separated; as well as the uncleanly and indecent, and those in a state of dementia or idiocy. The necessity for these arrangements will be self-evident to a judicious superintendent; and, as a general rule, it may be remarked, that the greater the number of divisions, the more satisfactory will be the treatment.

Where the insanity is partial, or, if general, has been mainly removed, every kind of mental occupation, that may prevent the insane ideas from intruding, should be inculcated; for although insanity must be esteemed essentially a physical disease, it is not one, which, after it has continued for some time, can generally be cured by such remedies as are known to remove ordinary physical excitement. The period soon arrives, when a judicious moral management is the main stay of the physician.

By a proper classification, it will be found, that there are comparatively few, who are incapable of participating in labour or amusement. Every well devised insane asylum ought, therefore, to be able to employ such of the patients as are fitted for the task in agricultural or horticultural labours; workshops should be provided, and employment, of some kind or other, be carefully adapted to each individual. The attention, which such occupations require, produces a moral revulsion, and prevents the topic of hallucination from recurring, or, should it recur, from wholly engrossing the mind of the lunatic. This is now so well understood, that in the different insane establishments, it is an object of anxious solicitude on the part of the medical superintendent, and the results have been most salutary. (*Sir W. Ellis, and the Reports of the Insane establishments of Frankford, Pa.; of Vermont; the McLean Asylum, at Charlestown, Mts.; the Asylum at Worcester, Mts. &c.*)

The reports of these institutions sufficiently testify to the interesting fact, that however perverted may be the reasoning powers, there

are but few, who are unsusceptible of appropriate appeals when judiciously made. Fifty years ago, it would not have been credited, that numbers have attended public worship in the chapels of those institutions, and conducted themselves with the greatest decorum, who, in the halls were noisy, talkative and profane.

The new impressions, produced by travelling, are productive of benefit in the same way, especially to the monomaniac; and exercise of all kinds—gymnastic, as well as those already mentioned—should be inculcated. Music has been extolled by some, deprecated by others. Where the patient is a performer upon any instrument, the permitting of the enjoyment may furnish, for the time being, an occupation to the mind; but caution is always needed in properly adapting the music to the patient; as there is danger of calling up some association, which may reproduce the morbid hallucination. Music is, indeed, asserted by some to have generally aggravated the symptoms. (*Andral, Prichard.*)

The rules, laid down by a writer already cited, (*Georget,*) for the mental management of the insane, are wise and applicable to most cases. *First*, Never to excite the ideas or the passions of the patients in the direction of their delusion. *Secondly*, Not to oppose directly their irrational ideas and opinions by reasoning, discussion, opposition, contradiction, pleasantry or raillery. *Thirdly*, To fix their attention on objects foreign to their delusion, and to communicate to their minds new ideas and emotions by varied impressions.

All this, however, must be left to the discretion of the physician: for whilst he might, with much propriety, withhold from one labouring under religious insanity, any holy books and exercises, which might excite the insane idea; he may even find it advisable, with certain monomaniacs, to attract their attention to the subject of their delusion. A lunatic fancied he could not suffer his urine to pass without the danger of producing a second deluge, but he was prevailed upon, by being told that the town was on fire, and that he could, in that way, save it from total destruction. (*Esquirol.*)

Cases, in which persons have fancied they had something alive within them, are said to have been relieved by being provided with a living animal, and persuading the patient, that it had been removed by some operation. A patient presented himself at the Hôpital St. Louis, stating, that he had a serpent in his belly. The attending physician, (*J. Cloquet,*) favoured the idea; but procured a serpent, and, making a slight incision through the integuments, pretended that he had extracted the serpent through it: the person was cured. The author has not been so fortunate. In two cases of the same sort, the hallucination has continued in spite of every attempt, although it was benefited for a time, by a deception similar to that practised by M. Cloquet; and in a third case in the Philadelphia Hospital, in which the female believed that she had been pregnant for years, and implored upon the author to open her abdomen and extract the foetus, every endeavour was made to

satisfy her that she had miscarried; pains were simulated by the electro-magnetic apparatus, and a fœtus, provided for the occasion, was exhibited to her as the result, yet the delusion persisted. According to the author's experience, when the hallucination has been violently removed in these cases, it has assumed some other form. The only chance of cure has been in gradual banishment of the delusion by appropriate and protracted mental revulsives.

It has been recommended, recently, to administer the douche, in cases of monomania or partial insanity, whenever the individual dwells upon the subject of his delusion. (*Leuret.*) Where, for example, he believes himself to be a Napoleon, it has been advised, that he should be placed under the bath, and that this course should be repeated until he ceases to make the assertion. This may do in some cases, by the revulsion it induces; but no permanent benefit can be expected from it generally. It may, indeed, merely induce the individual to conceal his hallucination; and, moreover, no decided advantage can result, unless the pathological condition of the encephalon can be, at the same time, removed, and this demands an appropriate and long sustained treatment.

Relapses being extremely frequent, it is important, that the patient should not be exposed to any powerful mental emotion, and that he should be permitted to enter gradually into the scenes to which he had been habituated prior to his insanity.

The diet must be regulated according to the indications. No rules can be laid down. At times, obstinate lunatics positively refuse to take food. Solitary confinement, or the douche, or the rotatory chair will generally compel them to yield. If not, it has been recommended to inject soup or broth into the stomach through the nose by means of the stomach tube. Pressing firmly on the fossa immediately anterior to the meatus auditorius externus will generally compel the patient to depress the lower jaw.

The remarks, made above, apply equally to *Puerperal mania*, *Mania puerperarum acuta*, *Mania lactea*; Fr. *Manie puerpérale*; Ger. *Manie und Melancholie der Wöcherinnen*, *Wahnsinn der Kindbetterinnen*, from which the patients are usually restored mentally, provided they survive the condition of the system—generally, one of irritation and consequent exhaustion—under which the disease arises. Blood-letting is discountenanced by all, unless under great signs of plethora and vascular excitement, and even then it should be practised with caution. (*Esquirol, Gooch, Prichard.*)

Local bleeding, cold applications to the head, and sinapised pediluvia, with purgatives and emetics—especially where there is disorder of the digestive tube—and full opiates, constitute the most approved treatment. A modern writer strongly enforces, as the “principal remedy,” “an immediate, mild, but efficient and sustained mercurial course.” (*M. Hall.*)

The diet should be moderately nutritious; and total seclusion at

home under appropriate care is indispensable in the generality of cases.

HYPOCHONDRIASIS.

SYNON. Hypochondria, Hypochondriacismus, Hypochondriaca passio, Affectio hypochondriaca, Morbus hypochondriacus, Malum hypochondriacum, Hallucinatio hypochondriasis, Dyspepsia hypochondriasis, Alusia hypochondriasis, Hypochondrism, Hypo, Low spirits, Vapours; *Fr.* Hypochondrie, Maladie imaginaire, M. Anglaise; *Ger.* Hypochondrie, Hypochondrische Uebel, Milzsucht, Rippsucht, Unterrippsucht, Unterknorpelsucht.

In strict propriety, hypochondriasis cannot be separated from mental alienation. It is unquestionably a form of monomania, and has been so regarded by several modern writers, (*Georget, Falret, Dubois d'Amiens, Andral, Prichard,*) although some are still disposed to class it with dyspepsia, with which it is undoubtedly often associated. Reference has already been made to the cases of *hypochondriacal monomania*, in which the persons believed that they had living animals within them.

The great characteristics of hypochondriasis are—a constant dread of imaginary, and, at times, of most singular diseases, or the most melancholy forebodings, and painful attention to real diseases, under which the person may be suffering, and which are often of very slight moment.

Of the former class are the dread of hydrophobia, which sometimes exists to a most painful extent,—the dread of cholera, *cholerophobia* as it has been termed, and of syphilis—*syphiliphobia*; the second when cholera is raging or has been expected to appear in any locality; and the third when a person has exposed himself to the infection of syphilis, and has especial cause for dreading the development of the disease. The author has already alluded to the distressing case of a professional friend, whose dread was beyond all bounds in consequence of having put his finger into the mouth of a hydrophobic patient, there being at the time an abrasion on it. The dread in this case amounted almost to hypochondriacal monomania.

A clerical friend, of most excitable imagination, applied to the author on one occasion, satisfied that he was labouring under rabies;—that he had the hydrophobia or dread of water, and was attacked with spasms when he attempted to swallow. He had not been bitten, but had been perusing a horrible detail in the newspapers, and subsequently consulted a medical work on the subject before he applied for the author's advice.

Many singular examples of the *hydrophobic monomania*—as this variety has been termed—have been recorded. The following is stated to be authentic. Two brothers were bitten at the same time by a rabid dog. One of them set off for America, where he resided for twenty years. After this, he returned to his native country, and learning that his brother had died with every symptom of hydrophobia, his imagination was so affected, that he died soon afterwards with the same symptoms. (*Dubois d'Amiens.*)

This case is, however, apocryphal.

The author, just cited, has referred to the head of *monomanie hypochondriaque*, what he terms *monomanie nostalgique*, but not with much propriety, inasmuch as the sufferer does not live under apprehensions in regard to his own bodily health, but sighs incessantly for the country whence he has been separated, and to which he apprehends he may never be able to return. The affection is unquestionably a form of monomania, but not of the hypochondriacal kind. The Germans well render *nostalgia* by the word *Heimweh*, which literally means "home-ache," and it is said to have been more frequently seen in the Swiss, who have left their native land, and whose every thought is bent upon regaining it. In a nation, migratory as the people of the United States are, this form of melancholy is but rarely witnessed.

The symptoms of hypochondriasis are most diversified, and generally exist along with the healthy play of various functions. At other times, the digestive or other functions are more or less deranged, and immediately the fears of the patient overcome his reason, and he imagines the most trivial symptom to be of the greatest moment. Slight flatulence or distension of the stomach is, in his view, a positive sign of serious inflammatory or other mischief in that viscus. The smallest modification in the number of the evacuations from the bowels, or any change in their character, is the cause of the greatest anxiety; and the dread of some impending disease of a still more serious character, or of death, renders his existence miserable. "I have known a father," says a recent writer, (*Brigham*, of Hartford,) "in whom I could discover no disease, regardless of the sickness and approaching death of a child, constantly saying, that his own case was more severe and alarming."

Pathological characters.—Morbid anatomy has thrown no light on the nature of hypochondriasis. Many appearances have been observed on the dissection of confirmed hypochondriacs, but none of them could be assigned as the cause of the morbid phenomena. They have been generally concomitant, and occasionally perhaps consequent. Moreover, all of them have been present without hypochondriasis. The disease is unquestionably encephalic, and it is in the encephalon that we ought to look for the morbid appearances.

The *treatment* must be based on the principles laid down under Mental alienation. At the commencement, it must be mainly moral; but, at the same time, the patient's notions, in regard to his bodily diseases, must not be rudely contradicted. It is better, indeed, to appear to fall in with them, and to prescribe for their removal. Exercise in the open air, especially travelling exercise, with all the new impressions engendered by change of air, habits and scenery, are to be recommended; and the different gymnastic exercises should be advised. The patient is generally disinclined to all exertion; and, if left to himself, would usually brood over his

imaginary evils, and thus render his ideas more inveterately fixed, and consequently more difficult of eradication; but, by well directed efforts, he may be made to go abroad, or to engage in harmless games, that give exercise to the body, and, at the same time, afford mental occupation and amusement; or in the pleasures of the chase, or of sporting, or of horticulture or agriculture.

“As for the moral treatment of hypochondriasis,” observes a writer already cited, (*Dubois d’Amiens*), “we can give but very general precepts: the treatment is properly a question of judgment on the part of the physician. Great tact, great penetration, are requisite to understand how to modify it to suit the different characters of patients. The physician is thrown almost wholly upon himself, and that instantaneously,—interrogated, as he often is, by hypochondriacs, on questions of the most delicate nature. It belongs only to the philosophical physician to treat cases of this nature: the *materia medica*, with all its pharmaceutical riches, is useless. It is the influence of a correct and adroit mind over one that is disturbed, suspicious and irritable, which can alone exert any efficacy.”

It need scarcely be observed, however, that along with this moral treatment, due attention will have to be paid to any morbid phenomena that may occur in the course of the malady.

CHAPTER III.

DISEASES OF THE NERVES.

I. INFLAMMATION OF THE NERVES.

SYNON. *Inflammatio nervorum*; *Fr.* Névrite, *Inflammation des Nerfs*, *Phlegmasie des Nerfs*; *Ger.* *Nervenentzündung*.

THE nerves of the body, like the neurine of the great nervous centres, are, doubtless, liable to attacks of both hyperæmia and inflammation; but of the symptoms of the former affection we know little. The following remarks will, therefore, be confined to the latter.

Diagnosis.—Constant pain is experienced, which is increased on pressure; and although it may be liable to aggravation, it does not occur in distinct paroxysms, like neuralgia. The pain may, likewise, be traced, by pressing along the affected nerve; and the parts to which the nerve is distributed may be variously affected; muscles may be convulsed or paralyzed; loss of vision and of audition may arise from inflammation of the optic or of the auditory nerves, &c. &c. Inflammation of the pneumogastric nerve has been said to give rise to hooping-cough or to acute gastritis; but farther observations are necessary. (*Andral*.)

Inflammation of the great sympathetic has been assigned as the cause or consequence of many affections,—as of obstinate vomiting, cholera, and other diseases of the alimentary tube, and of different parts of the economy; and this view has been founded on the appearances presented on dissection,—redness in the nerve itself or in some of its ganglions being perceptible, (*Lobstein, Delpech, &c.*) but, in other cases of the same diseases, no such pathological appearances have existed. (*Andral.*) Here, again, fresh observations are necessary.

The disease may be either acute or chronic; and, after it has persisted for a time, it may terminate in neuralgia.

Causes.—Neuritis may be induced by external violence, as by bruises or puncture. Accordingly, it supervenes, at times, on surgical operations, as on blood-letting; but it may, likewise, arise from causes within the economy, and which are inexplicable.

Pathological characters.—A nerve becomes red when acutely inflamed, but yellow, if the inflammation has passed to the chronic stage. (*Béclard, Gendrin.*) It may likewise be swollen, indurated or softened. At times, the neurilema alone exhibits signs of inflammation; but, in other cases, the neurine itself has lost its usual characters, and presents the appearance of a small fleshy mass. Under such circumstances, a serous fluid or pus may be found infiltrated between the nervous fibrils. (*Andral.*) These are the appearances usually met with in neuritis and *neurilemitis*.

Treatment.—If the inflammation be very violent, it may be necessary to draw blood from the arm, or to cup or apply leeches along the course of the affected nerve, where this is practicable, following up the blood-letting by full doses of narcotics and other sedative agents. In chronic cases, revellents are demanded,—as blisters, or the ointment of tartrate of antimony and potassa, or the ammoniated lotions of Granville.

II. NEURALGIA.

SYNON. Rheumatismus spurius nervosus; *Fr.* Névralgie; *Ger.* Nervenschmerz, nervöses Reissen.

Neuralgia or *tic douloureux* is one of the most painful diseases to which man is subject. It essentially consists of a more or less acute, exacerbating, or intermittent pain, seated in a nerve, and shooting along its ramifications.

Diagnosis.—The pain, in neuralgia, generally occurs suddenly; but, at other times, a slight sensation of itching or of heat, or creeping or numbness is felt in the part, which gradually becomes more and more intense. At other times, again, the paroxysm of neuralgia is preceded by a feeling of coldness and numbness. The pain is commonly extremely acute and lancinating, taking place instantaneously, and extending along the nerves like an electrical shock,—whence these pains have been termed, by a well-known writer on neuralgia, *Fulgura doloris*. (*Cotugno.*)

When the pain is at its height, it seems as if burning needles

were thrust into the affected parts. After a time, the agony diminishes, and is alternately replaced by a sense of numbness, which remains until the pain recurs. Exacerbations and remissions of pain take place at intervals, until ultimately the suffering becomes endurable, which it scarcely was at the height of the paroxysm.

When a sensation of cold is experienced in the affected part, no depression of temperature is indicated by the thermometer, neither is there usually any sign of inflammatory action, or of hyperæmia in the seat of the neuralgia. When the affected nerves, however, are distributed to muscles, they are often agitated by slight contractions, which scarcely merit the name of spasms or convulsions. When the pain remains a long time severe, the heart and arteries sympathize, beating with more force than usual,—but this is the result of the suffering, and is no evidence of the coexistence of local phlegmasia.

If, on the other hand, the diseased nerve is distributed to organs whose office it is to secrete, these organs have their functions augmented by the irritation; and the secretions accomplished by them are usually, under such circumstances, morbid.

If the disease persists, the agitations of the muscles become permanent, so as to give rise to involuntary catchings, which the French term *tics*, whence neuralgia has obtained the name *tic douloureux*; and, under similar circumstances, there is a tendency in the secretory organs to have their secretion inordinately excited. At times, however, as in sciatica or femoro-popliteal neuralgia, the nutrition of the limb becomes affected; so that atrophy and paralysis are the consequence of the nervous derangement.

It is scarcely to be expected, that a disease, characterized by such violent pain, could exist for any time without affecting the general system; accordingly, the nutrition of the whole body often suffers; rest is impracticable; digestion difficult, and, in the worst cases, the patient dies, worn out by constant irritation. These formidable cases are, however, rare. It fortunately happens, that the mass of cases yield to time, or to the employment of appropriate remedies. Relapses are very common, until the force of habit has been overcome by a long freedom from an attack.

When once sleep is obtained, the neuralgic pains appear to be suspended. "A person," says a distinguished surgical writer, (*Sir B. Brodie*), "suffering from *tic douloureux* in the face, may for a time be prevented from falling asleep, but, if once asleep, his sleep is likely to be sound and uninterrupted for many hours."

He states, that although there may be exceptions to this rule, they are comparatively few. The same immunity generally exists during sleep in chorea, and it is said to be present, likewise, in the spasmodic wry neck, in which the involuntary contraction of some muscles drags the head awry. Persons affected with this deformity when awake, have their necks flexible enough, it is said, when they are sleeping. (*Watson*.)

The duration of the disease is uncertain. It may be transitory,

or it may last for months and years; cases, indeed, are described, in which a fortunate result has supervened after the disease has persisted for ten or twelve years. (*Andral*.)

Neuralgia has received various appellations, according to its seat. At one time it was supposed to affect the portio dura or the facial nerve very frequently; but the observation of physiologists, that this nerve is destined for motion, excited the attention of pathologists to the subject, and it has been found, that it is situated—in these cases—in the different branches of the fifth pair. (*Andral*.) Of 40 cases of facial neuralgia, two only were found to be affections of the seventh pair, (*Berlinghieri*), and *Andral* regards them to be "*false neuralgia*." In these 40 cases, the disease was on the left side.

Facial neuralgia has received the names, *frontal* or *supra-orbital*, *infra-orbital*, *maxillary*, *dental* and *lingual neuralgia*, according as the frontal, infra-orbital, superior and inferior maxillary or lingual branch of the fifth pair were implicated.

The infra-orbital has generally received the name *tic douloureux*. It gives occasion, at times, to convulsive movements of the lower eyelid, cheeks and upper lip, and to agony which is almost beyond endurance.

The dental neuralgia is a form of toothache, but takes place without any caries of the teeth, shooting along the jaw and along the nervous ramifications, so as to induce the most horrible suffering.

Neuralgia, at times, also affects the trunk, following the intercostal nerve, and hence termed *intercostal neuralgia*; and at other times, it is seated in the parietes of the thorax, and hence termed *thoracic neuralgia*. Occasionally it attacks the female mamma, (*mammary neuralgia*), so as to induce a suspicion of the existence of some cancerous affection; and one of the severest forms affects the nerves of the spermatic cord and testes, extending to the nates and thighs, and implicating the bladder so as to occasion frequent micturition. The *ileo-scrotal neuralgia* descends from the lumbar region along the psoas magnus to the scrotum.

The nerves of both the upper and lower limbs may be equally affected with this disease; but we more frequently observe it in the latter. The *sciatic* or *femoro-popliteal neuralgia* extends from the sciatic notch along the back part of the thigh to the ham, and thence, occasionally, to the foot; and, in a slight degree, it is not uncommon during pregnancy.

Femoro-pretibial neuralgia commences at the crural arch, and passes along the inner portion of the thigh to the anterior part of the leg; and the *plantar neuralgia*, which is less frequent than either of the two last, is limited to the plantar nerve. Hemicrania (q. v.) may be regarded as a variety of neuralgia.

These are the varieties, which have received special names from medical writers; but it is obvious, that many more might be enu-

merated, if we were to specify all the nerves, which from time to time are found to labour under it.

The term *false neuralgia*, has been assigned to pains along a nerve, or its ramifications, produced by some body compressing it; those pains terminating with the removal of the compressing cause. Thus, tumours in the pelvis may cause pain along the sciatic nerve. A modern writer (*Andral*) attended a man who suffered most agonizingly from neuralgia irradiating from the mental foramen. The disease was induced by syphilitic periostosis, and it disappeared as soon as the system was affected by mercury. "This," says *Andral*, "was one of the most beautiful results that I have ever witnessed."

Causes.—The causes of neuralgia are very obscure. Unquestionably, however, a predisposition to it, of the nature of which we are altogether in the dark, exists in certain individuals. It would seem, however, as might be anticipated, that persons, of a highly impressible nervous system, from nature or from habit, are most liable to be affected by it. The disease is altogether neuropathic; for although some pathologists have considered it to be inflammatory in its character, all the phenomena described above are unfavourable to the belief, and indicative of a wide distinction between neuritis and neuralgia.

Neither very young nor old persons are often the subjects of neuralgia. Some curious differences in regard to age are observable, as respects the different forms of neuralgia;—the infra-orbital more frequently attacking adults, and the femoro-popliteal the aged. The belief has been, that females are more liable to the disease than males, (*Fothergill*, *Dubois* d'Amiens;) but this is scarcely established. Both sexes appear to be equally subject to neuralgia of the face, whilst sciatic neuralgia, would seem to be more common in men than in women. (*Andral*.)

When the predisposition to the disease is strong, and especially when it rests on previous attacks, very slight causes are sufficient to develop it. A cold wind—especially when moist—and, at times, the slightest breath of air passing over the face, may develop facial neuralgia of the most tormenting kind. Even the touch of the razor will, at times, excite the utmost severity of suffering. In other cases, and in predispositions to other forms of neuralgia, exposure to damp and cold is, perhaps, the most common exciting cause. It must be admitted, however, that our acquaintance with both the occasional and predisposing causes of the disease is extremely limited, and sufficiently imprecise. It has been remarked, (*Andral*,) that it is generally allowed, that cold and moist countries are more favourable to neuralgia, wherever seated, than those which are mild and more free from humidity; and M. *Andral* adds, that he has seen the best effects from sending his Parisian patients on a journey to Italy. It is obvious, however, that the good effects may have resulted, in these cases, from mere revulsion,—one of the most valuable agencies, which we can invoke in cases of

neuralgia—rather than from the causes to which M. Andral ascribes them.

External injuries may give rise either to neuralgia or to neuritis. It has, indeed, been considered, that all such cases belong properly to the latter. (*Andral*.) The cicatrization of an old ulcer is said to have caused it; and when once it has been induced, the recurrence of the paroxysms is often brought on by mental emotions. It rarely happens, that they give rise to it *de novo*.

Some most distressing cases of neuralgia, induced by wounds received in battle and otherwise, are recorded, (*Sir B. Brodie, Denmark*;) and frequently, the pain may be experienced in the sentient extremities of the nerves at a considerable distance from the injured portion of nerve. Hence, the importance, where we can discover no cause of pain in the part itself, of looking for some possible source of irritation in the trunk of the nerves, from which the part is supplied with nervous fibrils. (*Watson*.)

In short, where the predisposition is marked, any corporeal or mental excitement or derangement may develop the disease.

Neuralgia, being periodical in certain cases, it has been presumed to be owing to malarious influence; and has been accordingly classed among malarious affections. (*Macculloch*.) The author has had no reason to adopt this opinion; although it can be readily imagined, that constant exposure to malarious influences may heighten the impressibility of the individual, and render him perhaps more susceptible to the disease on the application of adequate exciting causes.

The cause of the neuralgia may be seated in the brain, the spinal marrow, or in the nerve affected.

Pathological characters.—The evidence, afforded by pathological anatomy in this disease, is far from being satisfactory: “It is often,” to use the language of a modern writer on this subject—“negative, always equivocal, and never decisive.” (*Jolly*.) The affection is, doubtless, owing to organic changes in the parts affected, as in the case of the various neuroses already described, but these changes are as yet inappreciable. By some, the appearances offered by neuritis have been depicted as belonging to neuralgia; by others, deductions have been drawn from a few facts, and, therefore, prematurely. One has regarded the disease as dependent upon dropsy, or serous infiltration of the nerves, (*Cotugno*;) another has seen a varicose or distended state of the veins in the vicinity of the affected parts, (*Bichat*;) whilst others have noticed the products of inflammation, of neuritis or neurilemitis,—redness, augmented size of the nerves; softening, induration, &c.—and have referred all the phenomena to inflammation and its consequences,—thus confounding neuritis and neuralgia. (*Siebold, Ollivier*.)

Cases of neuralgia of the head have been published, (*Bright, Holst, Landberg*;) in which tumours were found in the brain; and other instances are recorded, in which the disease was connected with some morbid condition of the bones of the head and face. (*Sir*

H. Halford, Watson.) The late Dr. Pemberton, of London, who was in very extensive practice, and enjoyed a high reputation, was obliged to leave the active exercise of his profession, in consequence of his intense suffering from neuralgia faciei. He ultimately died of apoplexy; and, on examining his head, the os frontis was found unusually thick, and on the falciform process of the dura mater, at a little distance from the crista galli, a small osseous substance was discovered, nearly half an inch long, and almost as broad. (*Watson.*)

Small tubercles are occasionally found developed in the course of nerves, which give occasion to excruciating neuralgic pains, and may be caused by inflammation; but it can be readily understood, that they may—like many other morbid productions—be owing to nutritive irritation in the part, without any of the evidences of positive inflammation being present. These *subcutaneous tubercles* are distinguished during life, by an examination of the part affected, when a small body of the size of about half a pea is felt under the integuments. A case of the kind, occurring on the thumb of a shoemaker, and probably from a puncture of his awl, is related, which was cured at once, after years of suffering, by excision. (*M. Hall.*)

In true neuralgia, no alteration, that can be at all esteemed pathognomonic, is to be expected in the affected parts. (*Martinet.*)

Treatment.—A vast variety of therapeutical agents has been employed in this rebellious disease, and in certain cases all have failed. This circumstance has given rise to empirical trials of the most heterogeneous and heterodox character. Being essentially neuropathic, and not inflammatory,—although at times with inflammatory complications,—the treatment must of course repose on agents that are adapted to modify the condition of the nerves, either locally, or by acting on the whole of the nervous system.

It can never happen, that general blood-letting can be required for pure or simple neuralgia; but signs of polyæmia may be present, which, as in other diseases, may render it expedient. Leeches and cupping may, however, be beneficial more by their revellent than their depleting action; and in all cases it must be borne in mind, that great loss of blood cannot fail to add to the impressibility, and may thus aggravate the neuralgia, or occasion a relapse if the attack has passed away. Andral prescribed for a lady affected with neuralgia the application of a certain number of leeches. From neglect, or other cause, the leeches were not applied until ten days afterwards. In the mean time, the pain had entirely disappeared: apprehensive, however, of a relapse, she applied the leeches, and at the moment of their seizing hold, the neuralgia returned with great intensity.

The various external agents which have been employed, have been either soothing or revellent.

In an affection characterized by so much nervous irritation, topical applications of a soothing or narcotic character are obviously

indicated, and, accordingly, they have been largely employed. Warm, and cold applications, and vapour fumigations of water, have been extensively used where they could be made to come in contact with the parts affected; but preparations of narcotics have been found more efficacious.

Washes and cataplasms, made of opium, or of the watery extract, or of the decoction of poppy heads, have, at times, afforded relief.

A cataplasm of belladonna and hydrocyanic acid has been advised, as well as an ointment of the former.

R.—Extract. belladonnæ, ʒss.

Adipis suill. ʒss.—M. et fiat unguentum.

In Germany, as well as in this country, the stramonium is used in similar cases,—the warm leaves being applied to the part, or the powdered leaves made into a cataplasm.

Under the head of revellent topical applications may be classed the various liniments and other applications that have been employed in neuralgia. Although some of these have been partly indebted for their efficacy to the substances, narcotic or other, that have been associated with them, the friction has unquestionably exerted an excellent revulsive agency.

The external use of the cyanuret of potassium has been advised of late years in some cases of facial neuralgia. (*Lombard.*) It is used in the form of watery solution or of ointment, according to circumstances. The watery solution is of the strength of from one to four grains to the ounce of water; and the ointment is composed of from two to four grains of the cyanuret to an ounce of lard. By one writer, (*Lombard.*) it is considered that the soothing properties of the cyanuret are superior to those of any remedy known.

Others have recommended the cyanuret in the proportion of four grains to an ounce of water as a local application in various forms of neuralgia. (*Trousseau and Rullier.*)

The aconitia, veratria, and delphinia, have been advised in the various forms of neuralgia, and the same remarks apply to all. When dissolved in alcohol, or made into an ointment or liniment, and rubbed, for a minute or two, on the skin, a sensation of heat and pricking is experienced, succeeded by a feeling of numbness and constriction in the part, as if a heavy weight were laid upon it, or as if the skin were drawn together by the powerful and involuntary contractions of the muscles beneath. This effect lasts two or three, and, at times, twelve or more hours, according to the quantity rubbed in.

R.—Aconitiæ, seu delphiniæ, seu veratriæ. gr. i.—iv.

Alcohol, ʒj.—Solve.

R.—Aconitiæ, seu delphiniæ, seu veratriæ, gr. ij.—iv.

Alcohol, gtt. vj.

Adipis, ʒj.—M.

The size of a hazelnut to be rubbed in.

R.—Aconitiæ, seu delphiniæ, seu veratriæ, gr. iv.—viij.

Solve in

Alcohol.

Linim. sapon. aa ʒss. fiat linimentum.

The mode of applying them is to rub a small portion over the whole seat of the affection, until the pain is either for the time removed, or until the full effect is induced on the cutaneous nerves; and the friction should be repeated three or four times, or more, during the day, according to the effect on the disease,—the proportion of the agent being increased at every second or third rubbing. Unless the peculiar impressions, described above, are produced, these agents have been found devoid of influence on the disease. *Turnbull, Skey*, (Aconitia); *Turnbull*, (Delphinia); *Turnbull, Ebers, Brück, Suffert, Professor Jackson*, of Philadelphia, *Cunier*, (Veratria.)

To produce a joint anodyne and revellent agency, various combinations of narcotics and essential oils have been advised; but the one most commonly used, and which is capable of exerting all the beneficial effects of the class, is a union of opium with camphor liniment,¹ which may be employed in the form of friction several times in the day, should any resulting relief encourage its continuance so long.

¹ R.—Liniment. sapon. comp., seu linim. camphoræ, ℥iss.
Tinct. opii, ℥ss.—M. ut fiat linimentum.

Of pure revulsives or simple counter-irritants, almost every variety—perhaps every variety—has been used in neuralgia.

Blisters would obviously suggest themselves, and they have done service, but they are not thought equally applicable to all cases of neuralgia; and, in most of the forms of neuralgia faciei cannot be well applied near the seat of the affection. As, however, the use of pure revellents would appear to be as strongly exerted when they are applied so far from the seat of the disease as not to implicate the same vessels and nerves, the objection is not of much force, as they can be placed behind the ears. (See the author's *General Therapeutics*, Philada. 1841.)

Blisters, too, are serviceable in another manner. They prepare the way for the endermic use of narcotics; and, in this manner, the salts of morphia may be used so as to exert their agency;—one or two grains, or more of either the sulphate, the muriate, or the acetate, being sprinkled upon the denuded skin, and repeated as the case may require.

It is proper, however, to remark, that many practitioners have recommended, that the various forms of counter-irritants should be applied immediately over the affected nerves. In this manner, the moxa has been prescribed—not applied so as to excite an eschar, but merely rubefaction and inflammation of the skin. A good method of applying it in these cases is to take hold of the moxa with a pair of forceps, and place it so close to the skin as to excite pain and redness; then moving it onwards along the affected parts, so as to excite them in a similar manner.

Besides the moxas proper, it has been recommended to cut a piece of linen or paper of the desired size, immerse it in spirit of wine or brandy, and lay it on the part to be blistered,—care being

taken, that the moisture from the paper or linen does not wet the surrounding surface. The flame of a lighted taper is then applied quickly over the surface, so as to produce a general ignition, which is exceedingly rapid; at the conclusion of the operation the cuticle is found detached from the true skin beneath. This is a variety of the moxa, and is often very successful in relieving deep-seated pains of the neuralgic kind; but it is said to be attended with intense suffering. (*Granville*.)

The ammoniacal preparations of Gondret and Granville to which reference has been made already in this work, and at great length in another, (see the author's *New Remedies*, 3d edit. p. 502, Philad. 1841,) would seem to be preferable modes for exciting rapid counter-irritation and vesication. The author has often used the lotions of Granville in the various forms of neuralgia, and especially in the "sciatic," and with decided benefit. Their efficacy, in such cases, cannot, indeed, be contested, but they are apt to leave painful sores which heal with difficulty.

R.—Antim. tartrat. et potass. p. j.

Adipis p. vij. fiat unguentum.

The size of a hazelnut, to be rubbed on the part, night and morning.

Frictions with the ointment of tartrate of antimony and potassa have, also, been used, as well as with the croton oil;—from 12 to 15 drops being rubbed on the surface until it becomes red, and the friction being repeated twice a day or oftener.

These are the excitant topical applications which are most commonly, perhaps, employed, but it is scarcely necessary to add, that any of the ordinary excitants may be productive of the same results in different degrees. Rapid counter-irritants are, however, the most effective in such cases. Upon the same principle, electricity has been advised in the form of aura, sparks, and even shocks; but it is not much employed. More favour has been bestowed upon galvanism, especially when applied in the mode recommended by an English writer on epilepsy. (*Mansford*.) In cases of femoropopliteal neuralgia, and, indeed, in various anomalous neuralgic pains, a portion of the cuticle, of the size of a sixpence, is removed by means of a small blister from the back of the neck as close to the root of the hair as possible; and a similar portion is removed from the hollow beneath, and on the inside of, the knee, as the most convenient places. To the excoriated surface on the neck, a plate of silver, varying, according to the age of the patient, from the size of a sixpence to that of half a crown, is applied, having attached to its back part a handle or shank, and to its lower edge—and parallel with the shank—a small staple, to which the conducting wire is fastened. This wire passes down the back, until it reaches a belt of chamois leather, buttoned round the waist; it then follows the course of the belt to which it is attached, until it arrives opposite the groin of the side on which we desire to employ it: it then passes down the inside of the thigh, and is fastened to the zinc plate in the same manner as to the silver one. The appa-

ratus, contrived in this way, is thus applied. A small piece of sponge, moistened in water, and, corresponding in size to the blistered part of the neck, is first placed directly upon it; over this a large piece of the same size as the metallic plate, also moistened, is laid, and next to this the plate itself, which is secured in its situation by a strip of adhesive plaster passed through the shank on its back; another above and another below it. If these be properly placed, and the wire, which passes down the back, be allowed sufficient room that it may not drag, the plate will not be moved from its position by any ordinary motion of the body. The zinc plate, is fastened in the same manner, but in place of the second layer of sponge, a piece of muscle, answering in size to the zinc plate, is interposed; that is, a small piece of moistened sponge being first fitted to the exposed surface below the knee, the piece of muscle moistened, or—what the author has found equally effectual and less inconvenient—a piece of moistened flannel or soft buckskin or parchment follows, and on this the plate of zinc. The plates must be moved twice a day, and cleaned.

Ample trial has been made of this plan in the various forms of neuralgia, (*Laënnec*, *T. Harris*, of Philadelphia, *Professor Chapman*, of Philadelphia,) both in public and in private practice. By Dr. Harris it was only found effectual in affections of the face, and, in these cases, it had to be persevered in for some time, before marked benefit was experienced. There are, doubtless, cases in which the excitant and revulsive agency of galvanism may be employed with advantage, but they are not so numerous as was at one time believed. The author has used the plates extensively in neuralgia, but he has not experienced so much success as to induce him to employ them frequently under the inconvenience that necessarily accompanies their use. They are, indeed, at this time, but little prescribed.

Some years ago, an “anodyne metallic” or “galvanic brush,” was recommended in cases of frontal neuralgia, from which excellent effects are described to have resulted. (*Von Hildenbrand*.) It consists of a bundle of metallic wires not thicker than common knitting-needles, firmly tied together by wire of the same material, so as to form a cylinder of about four or five inches long, and an inch or three-fourths of an inch in diameter. This is applied to the pained part, being previously moistened with a solution of common salt. It is not probable, that in this case galvanism is the agency concerned. Like the metallic tractors of Perkins, the effect is probably induced by the new nervous impression made through the excited imagination of the patient.

In this way, also, the animal magnetizer, by his manipulations, exerts a salutary operation; and the mineral magnet is indebted for its efficacy to the same agency. It is generally on the diseased part or around it, that the magnet is applied, and the application is made for a longer or shorter time according to circumstances,—being at times drawn along the nerves of the affected part, and at

others applied in a more prolonged manner. (*Andry, Thouret, Alibert, Cayol, Chomel, Récamier, Laënnec, Hallé, Blundell.*)

Acupuncture and electro-puncture have been advised in the same cases, and good has, at times, resulted, especially in neuralgia of the extremities. (*Elliotson, J. Cloquet, Riberi, Magendie.*) It has been argued, indeed, by a recent writer from the result in his experience from acupuncture, that neuralgia is a torpid state of the nerve. (*Jon. Osborne.*)

Electro-puncture or rather galvano-puncture has recently been much employed, and with success, in neuralgia faciei. (*Magendie, James.*) One platina needle is passed in towards the origin of the nerve, and the other towards its termination. One is at times sufficient to remove the complaint, (*James*); but if not, the positive pole of a galvanic pile may be connected with the former needle, and the negative with the latter. The relief has often been instantaneous. (*Magendie.*)

The great object in the internal treatment, is to allay the nervous erethism by the free use of narcotics. Their administration endermically has been already referred to, and when they produce unpleasant symptoms of narcosis, given by the stomach, they are occasionally administered in large doses by the rectum—the enema, as a general rule, being made to contain three times as much opium as would be administered by the mouth.

Of the various narcotics, opium is unquestionably the best. They have all, however, been given,—belladonna, hyoscyamus, stramonium, conium, &c.

R.—Ext. belladon. gr. iij., seu

Ext. hyoscyam., seu

Ext. stramon., seu

Ext. conii, ʒss.

Potassii cyanur. gr. iij.

Aquæ, ʒij.—M.

Dose, five to ten drops, gradually augmenting.

Many of the French practitioners extol the pills of Meglin, especially in facial neuralgia. They consist of a combination of a tonic with reputed antispasmodics and a narcotic.

R.—Oxyd. zinci.

Ext. valerian.

— fumar.

— hyoscyam. āā. ʒss. fiat massa in pil. xxxvi. divid.

Dose, one to four, a day.

The codeine has likewise been recommended, but it appears to possess no advantages over the other narcotics, whilst its price is enormous, the muriate having been sold in Philadelphia for no less a sum than four dollars the drachm.

Whatever narcotic is used, it must be pushed so as to induce some of the signs of narcosis. When the decoction of the leaves of the stramonium has been chosen, it has been advised to give it until it induces vomiting. (*Kirckhoff.*)

The hydrocyanic acid, in various forms, has been advised, but its

efficacy has not been marked. Of late, the cyanuret of zinc has been advised in neuralgia, (*Kopp*,) but much reliance is not placed upon it.

R.—Zinci cyanuret. gr. iv.
 Confect. rosar. ℥ij.
 Pulv. glycyrrhiz. q. s.—M. et fiant pilulæ lx.
 Dose, one, morning, noon and night.

The internal use of veratria has likewise been advised, along with its external administration, before recommended, or alone. (*Magendie*.)

R.—Veratriæ, gr. j.
 Aq. destillat. ℥ij.—M.
 Dose, a dessert spoonful, in sugared water.

The nux vomica,¹ (*Sir C. Scudamore*,) and strychnia,² (*Mart, Magnus, Pidduck*,) and camphor, in the dose of one or two scruples in the twenty-four hours, have likewise been given with occasional success, but their efficacy is not striking, and accordingly they are not much employed.

¹ R.—Extract. nucis vomicæ alcohol.
 ℥j.
 Ext. glycyrrhiz. ℥vij.—M. et
 divide in pil. lxxx.
 Dose, two to six, two or three times
 a day.

² R.—Strychniæ gr. ij.
 Conserv. rosar. ℥ss.
 Pulv. glycyrrhiz. q. s.—M. et
 divide in pil. xxiv.
 Dose, one to two, twice a day.

Being a disease—as has been remarked—neuropathic in its character, and characterized by excessive impressibility of the nervous system, agents which would restore tone to the nervous system generally, would seem to be indicated, and such appear to have been followed by the greatest success. Narcotics may palliate by affording relief during the paroxysm, but the prevention of subsequent attacks must depend on the influence exerted by remedies in the intervals.

The agent, of whose virtues in neuralgia we have the strongest testimony, is the sesquioxide or precipitated carbonate of iron. It was at first highly extolled about twenty years ago, (*B. Hutchinson*,) and several cases of cure, effected by it, were published. Since that time, numerous observers have testified to its beneficial action in neuralgia. (*A. T. Thomson, Stewart Crawford, R. MacLeod, J. E. Beale, R. Rowland, J. Elliotson*.)

The author has elsewhere alluded to one of the severest cases of neuralgia—under the form of hemicrania,—which he ever witnessed, and which rendered the patient's life miserable for years, that was entirely cured by the sesquioxide of iron. It need scarcely be said, that where plethora exists, or febrile irritation supervenes, it must be removed; the sesquioxide, however, even in large doses, rarely disagrees with the stomach, and where it does, the inconveniences may generally be prevented or removed by the addition of an aromatic,¹ or the administration of a cathartic.

¹ R.—Ferri sesquioxid. gr. xxv.—xl.
Pulv. cinnam. comp. gr. x.—M. et fiat pulvis ter die sumendus.

Or,

R.—Ferri sesquioxid.
Theriac. commun. āā. ʒj.—Fiat elect.
Dose, a teaspoonful, three times a day.

The cyanuret of iron¹ has likewise been administered with the same view, as well as the different metallic tonics, the acetate, sulphate, and ammoniuret of copper; the oxide and the cyanuret of zinc, &c.; but they have not been found equal to the sesquioxide of iron.

¹ R.—Ferri cyanur.
Sacch. alb. āā. gr. xviii.—M. et divide in chart. iij.
Dose, one, morning, noon and night.

Mercury, as in all severe diseases, has been recommended in this. Whatever good effect has been induced by it has probably been in the way of revulsion. It may be pushed so as to slightly affect the mouth.

R.—Hydrarg. protochlorid. mit. gr. xij.
Pulv. opii, gr. iij.
Micæ panis, q. s.—M. et divide in pilulas xij.
Dose, one, night and morning.

Some have supposed it to have a special action in neuralgia, but others have considered its beneficial agency to be restricted to cases in which the neuralgia has been dependent on syphilitic perioritis or exostosis. (*Andral*.)

The effect of the oil of turpentine in neuralgia is probably, also, altogether revellent. It is given by some so as to act upon the bowels; by others, in smaller doses, to affect the kidneys. In both cases, it sometimes induces considerable renal irritation, to which its good effects are partly owing. The dose, as a diuretic, may be twenty or thirty drops; as a cathartic, one or two drachms in the twenty-four hours, either mixed with molasses or in the form of an emulsion.

R.—Ol. terebinth. ʒi.
Mucilag. acac. ʒiij.
Aq. menthæ, ʒvss.—M.
Dose, a tablespoonful, three times a day.

Many cases are recorded of its salutary agency, (*Cheyne, Récamier, Martinet*.) A recent writer, indeed, (*Dubois d'Amiens*), concludes—in the face, however, of all evidence—that there are scarcely more than two remedial agents, which can be regarded as possessed of any efficacy,—the oil of turpentine and the pills of Meglin.

The creasote,¹ when it exerts any agency, probably acts also as a revellent.

¹ R.—Creasot. gtt. vj.
Mucilag. acac.
Syrup. simpl. āā. ʒij.
Aquæ, ʒvss.—M.
Dose, a tablespoonful, three times a day.

In some cases, great advantage appeared to be derived from it; but in others, and frequently, it was of no service. (*Elliotson*.)

The chlorate of potassa¹ has, likewise, been given in neuralgia faciei, (*Chisholm, Herber, B. Schüffler, Joseph Frank, Meyer*,) both as a curative and palliative.

¹ R.—Potass. chlorat. ℥iss.

Aq. destillat. ℥iv.—Solve.

Dose, a spoonful every two hours.

When the affection is markedly intermittent, and especially if it observes anything like regular periods of recurrence, it is more manageable, and may often be removed by the cinchona and its preparations, given in the same manner as in an ordinary case of intermittent, and persevered in until all danger of a recurrence is over. In similar cases, arsenic, either in the form of arsenious acid, or of Fowler's solution, proves serviceable.

Such are the chief internal remedies that have been employed in the various forms of neuralgia. The most efficient are tonics and narcotics; and of these, the most permanently beneficial are the former.

Recently, a remedial agency has been proposed, which probably also acts by revulsion. In a case of intermittent neuralgia of the lobe of the right ear, a cure was accomplished by compressing the primitive carotid of the same side. Half an hour before the paroxysm, the compression was exerted, with interruptions of five minutes every quarter of an hour. (*Allier*.) The same person has reported a case of neuralgia of the orbito-frontal nerve; and, subsequently, of the nervus pudendus superior, respectively cured by compression of the carotid and abdominal aorta. The compression of the carotid of the affected side was continued for the whole forenoon, with pauses of five minutes every quarter of an hour. For the pudic neuralgia, the abdominal aorta was compressed for the space of three quarters of an hour. The neuralgia, in both instances, gradually ceased.

In extremely obstinate cases, especially of neuralgia faciei, it has been proposed, after other remedies have failed, to divide the affected nerves, and even to remove portions of them; but the former of these plans has often failed, whilst both have occasionally succeeded. Cauterization of the nerves has, likewise, been practised; but all these methods are extremely painful, and repugnant to the feelings. By employing the agents already referred to, and continuing in their use, and if one fails prescribing another, the perseverance and skill of the physician will often be crowned with success, when he might have been disposed to abandon the case as hopeless.

III. PARTIAL PARALYSIS.

SYNON. *Fr.* Paralyse partielle.

Of the paralysis that arises from lesions of the nervous centres, and especially from hemorrhage, the author has already treated at

some length. There are cases, however, of well marked loss of muscular power, which afford no morbid appearances on dissection, and yet where—as in the case of nervous apoplexy—some inappreciable change must probably have occurred in the neurine of the nervous centres. Several such cases have been recorded by different observers. (*Lelut, Andral.*) In many of these, the paralysis does not persist, but may disappear and recur in an intermittent manner: this can scarcely occur in the paralysis, which is dependent upon organic lesions. Occasionally, all power over the lower extremities is lost; and after the affection has endured for years, it may pass away, leaving the individual in perfect health. The author knew a case, in which a young lady was, for years, unable to move her lower extremities, or even to stand, and who was subjected, for a long time, to the usual excitant treatment employed in paralysis without effect, but who was perfectly restored apparently under the new evolution that took place at puberty. The paralysis wholly disappeared, which sufficiently shows that it must have been a neurosis, and not dependent upon organic mischief in the spinal cord.

An affection of an analogous nature appears to prevail in India, and has been described by writers at different periods, (*Bontius, Clark, Marshall,*) under the name of *Barbiers*. It is said to commence with more or less lassitude, pricking pains, and sense of formication in both lower extremities, along with numbness, tremors, and irregular spasmodic movements in locomotion. Occasionally, the forearms and hands are affected in the same manner; and, at times, the spasmodic action extends to the muscles of the larynx and chest, so that speaking and respiration are executed with difficulty. As the disease proceeds, the lower extremities become more and more rigid; the knees are spasmodically bent, so that the legs are straightened with difficulty, and instantly relapse into the bent position, when the effort ceases. Gradually, the symptoms increase in violence, until, at length, the limbs become quite paralytic, much emaciated and contracted, and lose their natural temperature. The general health likewise suffers, and there is loss of appetite, with indigestion, wasting, and general sinking of the vital powers,—the pulse latterly becoming weak, thready, or fluttering, and death taking place apparently from a gradual decay of the contractility of the muscular fibre. (*J. H. Bennett.*)

The morbid anatomy—and, consequently, the pathology—of *Barbiers*, is imperfectly understood. It is a species of paralysis, but whether attributable to morbid changes occurring in the spinal cord, or in the extremities of the nerves, is not known. At the commencement, the disease appears to resemble frequently chronic rheumatism; and, at a later period, paralysis from the poison of lead.

Similar affections appear to have been seen in other countries. (*Bostock, Copland, J. H. Bennett.*)

Of the paralysis of the upper extremities induced by the action

of lead, sufficient mention has been made elsewhere. (Vol. i. p. 173.) The effect—it has been supposed—is induced by the change produced by the metal on the muscular fibre. (*Andral*.) It is more probable, however, that it is exerted on the nerves distributed to the paralyzed part, or on the portion of the spinal marrow with which they are connected, (*Andral*;) yet it is strange, that those portions of the nervous system should be affected rather than others.

In this place, we shall inquire briefly into those cases of paralysis that are confined to small portions of the organism, to which they may remain restricted, or from which they may extend, so as ultimately to become general. Occasionally, it happens, that one muscle is paralyzed only; and, when this is the case, and there are no signs whatever of encephalic complication, the loss of power may be owing to pressure on the particular nerves that are distributed to the paralyzed muscle. Dislocation of the os humeri, by causing pressure on the circumflex nerve, has occasioned *paralysis of the deltoid*. Recently, the author has had a case of apparent paralysis of this muscle under his charge, but there was some reason to believe, that the patient was “malingering.” In many cases, however, the paralysis of a particular muscle may be a forerunner of serious cephalic mischief,—thus, the falling down of the upper eyelid, or the paralysis of one or more muscles of the fingers is at times a premonitory sign of apoplexy or of hemiplegia.

In the *strabismus*, which is observed in advanced stages of encephalic disease, there is paralysis of one of the motor muscles; and *aphonia* appears to be produced, in many cases, by paralysis of the muscles, whose office it is to stretch the vocal cords.

Paralysis of the tongue occurs as a symptom of general paralysis, and may, indeed, occur alone, owing to pressure on, or some morbid condition of, the hypoglossal nerve.

Paralysis of the face is not uncommon,—sometimes, accompanying hemiplegia; but, at others, dependent upon a morbid condition of the nerves distributed to the face, or of the part of the encephalon, with which they are connected. The two nerves of the face, are the facial or portio dura, and the fifth. The former of these is far more frequently affected.

Recently, two cases have been under the author's care, one of which was produced by mischief in the part of the encephalon, where the nerve originates, and the other by some source of irritation in the nerve, or by pressure upon it in its course through the aquæductus Fallopii.

This nerve is one of motion and not of sensibility; consequently, when attacked with paralysis, the muscles of the face lose their motive power, but the sensibility is not modified. The face is drawn towards the sound side, and the angle of the mouth carried higher, so that the mouth is oblique; the eyelids are opened widely, and the eye appears larger than the other. When the person laughs, it is altogether on one side of the face—the sound side, so

as to communicate a comical expression. Volition has, indeed, no power over the paralyzed muscles.

Yet although particular muscles are paralyzed; others, that are supplied by the motor or manducatory branch of the fifth pair, execute their duties. Thus, mastication can be readily performed.

Facial hemiplegia is sometimes induced in the infant by pressure exerted by the forceps on the seventh pair of nerves. It ceases, however, spontaneously in a period varying from a few hours to two months. (*Landouzy.*)

When the fifth pair of nerves is alone affected, mastication is impeded. There is command, however, over the muscles concerned in expression, and no evidence of distortion when the patient laughs.

This form of paralysis is seen in hemiplegia, in which there is, along with the loss of power, impaired sensibility; the latter being owing to the morbid affection of the ganglionic portion of the fifth pair; the latter to that of the ganglionless portion. (*Sir C. Bell.*) A case has been recorded of disease of the Gasserian ganglion, in which there was loss of sensibility on one side of the face, without the motility of the part being at all affected.

In many cases, the seventh and fifth pairs of nerves are implicated simultaneously. (*J. H. Bennett.*)

Paralysis is not unfrequently met with in *infancy*. It has been seen as early as the third day after birth; but it is more common during dentition. At times, it implicates one half the body, and is manifestly dependent, in such case, on mischief in the opposite hemisphere of the brain. In other cases, it is partial, and affects perhaps one upper extremity only. Frequently, the paralysis passes away, when it is topical; but when confined to one side of the body, it is rarely removed entirely, and often a second attack supervenes sooner or later, under which the patient sinks. If the disease be not speedily removed by the use of appropriate remedies, it usually becomes chronic, and the child sinks gradually in the course of a few months, "or drags on a miserable life of ten or twelve years, with more or less debility of the arms or legs, but very rarely arrives at manhood." (*Underwood.*)

Many of these cases appear to be induced in a reflex manner, (*Graves;*) or—to use the language of a modern writer (*M. Hall*)—eccentrically.

A deplorable condition sometimes exists, especially in aged individuals affected with diarrhœa, and which appears to be dependent upon *paralysis of the rectum*. The fæces are passed involuntarily, as it were,—the patient having no power over the sphincter.

Of the paralysis caused by lead, and that met with in the insane, mention has been made under Painter's Colic and Mental Alienation.

Workers in mercury are, likewise, liable to paralysis of the voluntary muscles, so that articulation, mastication and locomotion,

are executed with difficulty, and the use of the hands is almost wholly lost. Similar results appear to be produced by arsenic, given to such an extent as to produce poisonous effects. (*Christison.*)

Causes.—Some of the exciting causes of paralysis are sufficiently evident. Thus, it has been shown, that it is induced by the action of certain poisons. Generally, pressure is exerted, either upon the part of the nervous centres whence the nerve originates, or on the nerve itself. A recent writer has referred to cases, in which a thickening of the ligaments of the spinal canal had induced paraplegia. (*C. Key.*) We not unfrequently, too, find it developed under the influence of accidents, or of diseases, which injure either the spinal marrow or the nerves. It would seem, also, that causes—as cold—acting upon the sentient extremities of nerves, may give occasion, not only to loss of power in the nerves of the part, but even to hemiplegia. (*Graves.*) A case has been recently referred to (*Gerhard*, of Philadelphia,) in which “hemiplegia followed the exposure of the part affected to a very cold wind in a sleigh. It was finally cured by strychnia, which is almost never the case in hemiplegia depending upon cerebral causes.” Various forms of paralysis may, in like manner, be induced by disease existing elsewhere—as in the bowels or kidneys; although it is not always easy to trace, whether these are, in all instances, the cause of the paralysis, or the effect.

In regard to the prognosis in various kinds of partial paralysis, it will depend greatly on the character of the morbid condition. If the nerves proceeding to the part be destroyed, no cure can be expected; but, if there be merely a compressing cause, it may admit of remedy. Where the paralysis is dependent upon an affection of the neurine itself, this cannot always be diagnosticated, and, therefore, no sound prognosis can be given. The paralysis from lead, mercury and arsenic, is commonly removable; but, at times, it resists all kinds of treatment. That caused by dentition sometimes passes away with the subsidence of the cause. In all cases, the probable result must be deduced from the nature of the morbid influence, and the length of time it has been in action. The longer the affection has continued, the less certainty will there be of entire restoration.

Treatment.—The treatment of hemiplegia and paraplegia—as well as of paralysis induced by the poison of lead—has been given elsewhere.

Of late, the efficacy of electricity, in cases of paralysis, has been highly extolled. (*G. Bird.*) Where the paralysis, as in lead-palsy, affects the hands chiefly, electricity was employed in the form of sparks drawn from the upper part of the spine, “so as to exert its influence over the origin of the spinal nerves, forming the axillary plexus.” In cases where the general health was not much deranged, the use of electricity over the spine, and drawing a few sparks

occasionally from the paralyzed extensor muscles of the wrist and hand, with the exhibition of an occasional laxative, was generally remarkably successful.

Paralysis of the tongue may be treated by the use of excitant sialogogues—such as ginger, or the pellitory of Spain, or horseradish; and, by trusting to the recuperative powers, for the removal of the cause of the paralysis, where it cannot be readily appreciated.

Aphonia, induced by paralysis of the intrinsic muscles of the larynx, may be treated by chlorine in the way of inhalation. A friend (*Professor Pancoast*, of Philadelphia,) informed the author, that a case, occurring in a young lady, in whom there was but little voluntary power over the diaphragm, was cured by the inhalation of chlorine after the galvanic plates and the electro-magnetic apparatus had been used in vain. The chlorine may be inhaled from a common dish or inhaling apparatus, by dropping any of the acids on a mixture of chloride of lime, so that the acid may be disengaged slowly. (See the author's *New Remedies*, 3d edit. p. 134, Philad. 1841.) In like cases, any of the sialogogues, mentioned above, may be chewed; and a modern writer (*Rosen*) strongly recommends the chewing of cubebs. With a similar view, blisters may be applied to the neck; or the croton oil be rubbed over it. In one case, the strychnia given internally has been found of service, (*G. H. Richter*;) or it may be applied externally;—a small blister being placed over the neck, and half a grain of strychnia sprinkled on the raw surface night and morning.

In paralysis either of the portio dura, or of the fifth pair, blisters may be applied over the foramina whence the nerves issue; and the raw surfaces may be sprinkled with strychnia in the manner advised above; or moxas may be applied along the course of the diseased nerve. Electropuncture—as directed under Neuralgia of the face, (page 388,) has also been highly extolled, and electric and galvanic currents have been made to pass from the root of the nerve towards its ultimate ramifications. The author has not met with a case, that has resisted this mode of treatment; but it is proper to remark, that observation has proved, that it may disappear spontaneously, and without the employment of any therapeutical agents. (*Montault, Andral*.) In the practice of one observer, (*Heidler*,) repeated emetics have been found very efficacious.

In cases, which are accompanied by any signs of encephalic or other hyperæmia, it may be necessary to cup over the region of the mastoid process, and to employ antiphlogistics so as to reduce the activity of the circulation, before the other revellents are had recourse to.

The paralysis of infancy requires a similar treatment to that of the adult; blisters, electricity in the form of sparks or of the electric aura; and feeble galvanic or electro-magnetic influences, when it is more general. When partial, and affecting one or more extremi-

ties, it requires the same treatment as partial paralysis of the adult; the energy of the agents being adapted to the age of the individual.

Paralysis of the rectum has yielded, in many cases that have fallen under the author's care, to blisters to the sacrum, dressed endermically with strychnia.

The treatment of Barbiers appears to be that required for paralysis generally; modified according to the particular indications that may present themselves.

BOOK VII.

DISEASES OF THE ORGANS OF THE SENSES.

THE diseases of the organs of the senses are very numerous, and most of them have been referred to the domain of external pathology. A recent writer, on internal pathology (*Andral*,) includes, in his work, the diseases of the skin only; yet they also are considered by many, to belong to the surgeon rather than to the physician. The diseases of the eye now form part, in many countries, a separate department—*Ophthalmology*—which occupies a teacher exclusively, in several of the medical schools of Germany especially. The oculist and the aurist, likewise, pursue their special departments; and rank themselves amongst the surgeons, rather than the physicians.

As has been well observed, (*Rostan*,) the mere analysis of the *ex professo* treatises on ophthalmology, diseases of the ear, osphresiology, &c., would far exceed the limits, that could be assigned them in a general work on the practice of medicine.

The diseases of the different organs of the senses may implicate either the physical or the nervous part of the organ, or the organ of perception—the encephalon. Of the many disorders of the nerves of the senses, and their encephalic portion, frequent mention has been made. It will remain to treat of the diseases of the physical portions of the organs, and such local affections of the nerves as may not, thus far, have received attention. The different neuroses of the senses generally belong, indeed, to other diseases from which they cannot readily be separated. (*Rostan*.)

CHAPTER I.

DISEASES OF THE EYE.

SYNON. *Fr.* Maladies des Yeux; *Ger.* Augenkrankheiten.

THE eye—it must be recollected—has three coats, and four refracting bodies. Of these coats, none of which pass over the transparent part of the organ,—the *sclerotica*—a fibrous coat, formed of the albigineous tissue of Chaussier, is the outermost. Into this coat are inserted the various muscles that move the eye; and it may even be regarded as formed by the expansion of their tendons. Immediately within this, and feebly united with it, is the *choroid* coat,—a vascular and nervous membrane. This is lined by the *pigmentum nigrum*, which is wanting, or very light coloured, in the albino. Within this, again, is the *retina*, a soft, thin, pulpy membrane, formed chiefly, if not wholly, by the expansion of the optic nerve.

The transparent parts of the eye are, from before to behind,—1, the *cornea*, at one time regarded as a prolongation of the *sclerotica*, but capable of being separated from it by maceration. 2, behind the cornea, the *aqueous humour*, occupying the space between the cornea and the crystalline, and contained in its own serous capsule. 3, the *crystalline lens*, surrounded, also, by its capsule; and 4, behind the crystalline, the *vitreous humour*, invested by a delicate membrane—the *hyaloid*, which sends prolongations internally, that divide the humour into cells.

Separating the anterior from the posterior portion of the aqueous humour, the *iris* is seen, which gives the colour to the eye. By many, it is supposed to be a prolongation of the choroid; but it is rather a structure of a peculiar character;—according to some, muscular; according to others, essentially nervous and vascular; the nerves and vessels being distributed on an erectile tissue. In the centre of the iris is the *pupil*; which is dilated or contracted according to the diminished or increased size of the iris. As to the mode in which this modification of the size of the pupil is produced, much difficulty exists with the physiologist. The vessels and nerves distributed to it are ramifications of the ciliary,—the nerves arising from the ophthalmic ganglion and nasal branch of the fifth pair.

The essentially nervous portion of the organ is the retina, with the optic nerves, of which it is an expansion. By most physiologists, these nerves are considered to decussate wholly at what has been called the chiasma on the sella turcica. Others, however, believe, that no decussation occurs, whilst many of the best physiologists, (*Wollaston, Bérard, Gall, Spurzheim, Cuvier, Serres, G. R. Treviranus, J. Müller,*) consider, that the decussation is partial, and concerns only the internal filaments of the nerves; that

the other filaments pass directly on to the corresponding eye, so that one half of each eye is supplied by straight fibres proceeding directly from the root of the same side; the other half by those resulting from the decussation of the internal fibres. Thus, they attempt to explain the anomaly of vision, called *hemioptia*, in which only one half of an object is seen. The author has elsewhere given his opinion, that in the present state of our knowledge, there is not simply a junction, but that the optic nerves really decussate at the sella turcica. (See *Human Physiology*, 4th edit. i. 189: Philad. 1841.)

Lastly;—there are certain accessory organs, which are often concerned, more or less, in diseases of the eye.

The *eyelids* are formed, in part, of a loose cellular tissue beneath the skin, which admits of very ready infiltration, when the eye is inflamed. Lining the eyelids, and passing over the globe of the eye, is the *tunica conjunctiva* or *tunica adnata*, which is the most common seat of disease. It is a muco-serous membrane, and secretes a fluid, which, along with that furnished by the follicles to be described presently, and the secretion from the caruncula lachrymalis, constitutes the gum of the eye. At the very edge of the eyelids are cartilages called *tarsal* or the *tarsi*, in the substance of which are certain compound *follicles*, termed *meibomian*, which are thirty or forty in number in the upper eyelid, and twenty-five or thirty in the lower; these secrete a sebaceous fluid, and are much implicated in one of the forms of inflammation of the eye. A similar collection of mucous follicles is seated at the inner canthus of the eye. These bear the name collectively of *caruncula lacrymalis*. They secrete a thick, whitish humour to fulfil a similar office with the secretion from the meibomian follicles. The caruncula lacrymalis completes the circle, left imperfect by the meibomian follicles of the eyelids.

Lastly, the *lachrymal gland*, whose office it is to secrete tears for the purpose of keeping the tunica conjunctiva in a proper condition for vision, has its functions materially modified by different pathological conditions of the eye. Thus, whenever the eye is inflamed or irritated, a copious secretion of tears takes place, owing to the irritation extending along the ducts of the gland to the gland itself.

All these accessory organs are likewise liable to disease themselves, but they are not generally of much consequence.

Such are the parts, that are chiefly concerned in the diseases of the eye. Of the functions of the organ, the author has treated, at great length, in the work already referred to.

I. INFLAMMATION OF THE EYE.

SYNON. Ophthalmia, Inflammatio oculi, Cauma ophthalmitis; *Fr.* Ophthalmie, Ophthalmite, Ophtalmie, Inflammation de l'œil; *Ger.* Augenentzündung.

Modern ophthalmologists have made many and unnecessary divisions of ophthalmia. (*Velpeau.*) A recent writer, (*Most,*) has

an ophthalmia catarrhalis, O. rheumatica, O. morbillosa, O. scarlatiosa, O. variolosa, O. impetiginosa, O. scrophulosa, O. arthritica, O. venerea, O. menstrualis, O. hæmorrhoidalis, O. ex dentitione, O. neonatorum, O. senilis, O. scorbutica, O. Ægyptiaca, and O. erysipelatosæ;—from some fancied connection between the inflammation of the eye and the condition to which the epithet generally applies; by others, (*Sichel*), an abdominal or venous ophthalmia has been admitted, which is supposed to be generally connected with visceral derangement.

On the whole, perhaps, it is most advisable to consider inflammation, as it affects the different structures of the eye principally. It may be confined to one only, but often extends to others; still, the diseased condition generally predominates in some one, and the others become successively implicated.

A. INFLAMMATION OF THE CONJUNCTIVA.

SYNON. Inflammatio conjunctivæ, Conjunctivitis; *Fr.* Conjonctivite, Inflammation de la conjonctive; *Ger.* Entzündung der Bindehaut der Sclerotica und Cornea des Auges.

Although in every variety of inflammation of the conjunctiva, the same structure is necessarily implicated, the phenomena presented are so different as to admit of several subdivisions.

1. *Simple Inflammation of the Conjunctiva.*

SYNON. Ophthalmia catarrhalis, O. humida, O. serosa, Taraxis, Catarrhal inflammation of the Eye, Catarrhal ophthalmia, Catarrhal conjunctivitis; *Fr.* Ophthalmie catarrhale; *Ger.* Katarrhalische Augenentzündung.

This affection is rarely confined to the conjunctiva of the globe of the eye. It extends so as to affect both the eyelids and the meibomian glands,—*Ophthalmalmo-conjunctivitis* and *Blepharo-conjunctivitis*.

Diagnosis.—One of the earliest symptoms of conjunctivitis is more or less pain and heat, with a sensation as if some extraneous body, as sand, were beneath the upper eyelid. These symptoms, with increased vascularity, and more or less lachrymation, sufficiently indicate the disease. A recent anonymous writer (*American Notes to the Art. Inflammation of the Eye*, in Tweedie's Library of Medicine) affirms, that there exists no photophobia or intolerance of light, so long as the ophthalmia is simply catarrhal, and uncombined with sclerotitis; and he adds, that photophobia and lachrymation are almost pathognomonic of rheumatismal ophthalmia;—but this is calculated to mislead; for all agree, that intolerance of light and lachrymation are concomitants of almost all forms of ophthalmia. It would be strange, indeed, were it otherwise. They occur, indeed, even when there is no inflammation, as every one must have experienced, from the reflection of the bright light of the sun from the surface of snow.

The vascularity is, at times, very great, the vessels being tortuous, and streaming from every part of the globe of the eye towards the cornea, where the vascularity ceases. As the disease advances,

they form a kind of network over the eye, which can be easily moved on the subjacent textures by pressure with the finger.

Occasionally, infiltration takes place into the submucous cellular tissue, so that small ecchymoses are perceptible. If the disease continues, the secretion from the conjunctiva is increased in quantity, and opaque and puriform; or it may remain transparent, and impart to the observer an appearance of unusual moistness of the eyes, and to the patient a sensation of glueyness. (*R. H. Taylor.*) In the morning, the eyelids are generally glued together.

Commonly, there is more or less pain over the eyes, and constitutional disturbance; but where the affection is mild, there may be no sympathetic irritation whatever.

By some, the catarrhal form of inflammation of the eye is considered to be a severer form of simple conjunctivitis.

Causes.—The causes of this form of conjunctivitis are various. It may be produced by irritants of all kinds; by exposure of the eye to a strong wind, to intense light or heat, or to dust. It prevails at times epidemically, and is a most distressing endemic in our eleemosynary institutions, in which children are congregated together. At the Children's Asylum of the Philadelphia Hospital, it is often the cause of great anxiety to the attending physician; and, frequently, in spite of the best directed efforts, leads to loss of sight.

Its contagious nature has been admitted by many; and there are cases which it is difficult to explain upon any other principle. As in other diseases, however, that prevail endemically, it is often extremely difficult to decide, whether the affection has been received by communication from a person labouring under it, or is owing to the patient's having been exposed to the same exciting causes. By many, it is believed that the application of the puriform matter, secreted by the inflamed conjunctiva, when applied to a sound eye, may produce the disease, and in a form more severe, more distinctly puriform, and more dangerous in its effects upon the cornea, than the ophthalmia that gave occasion to it. (*Mackenzie.*)

Treatment.—It need scarcely be said, that this active form of hyperæmia and inflammation requires energetic treatment. In the first instance;—the cause—especially if it be an extraneous body—must, if possible, be removed. The eyelids may be everted, so as to expose the whole extent of the conjunctiva; and if any foreign substance be there, it may be removed by the extremity of a probe, or be washed away with warm water thrown in through a syringe. The author has seen some cases, in which a small particle of iron has impinged upon the cornea, and penetrated a layer, or rested in the conjunctiva: at times, this may be removed by the magnet, by the point of a cataract needle, or by a very fine pointed forceps; or it may be necessary to divide the outer layer of the membrane, so as to set it free.

Should the inflammation continue after the removal of the cause, and be at all severe, it will be advisable—as in other inflamma-

tions—to diminish the amount of the circulating fluid, by general blood-letting, and this may have to be repeated again and again, according to the urgency of the symptoms. It may be advisable, also, to take blood locally, by cupping from the temples or back of the neck, in which case we have the joint effect of depletion and revulsion. Leeches may likewise be applied to the temples or to the cheek. Could they be placed immediately over the hyperæmic vessels, they might, by emptying them, produce excellent effects; but this is, of course, impracticable. Leeching the eyelids has been proposed as a substitute, but this is a questionable measure, and has been so regarded by many therapeutists. The eyelids are too near the seat of the inflammation, so that the irritation from the leech-bites may extend to the seat of the inflammation, and augment the mischief.

Scarification of the conjunctiva is an excellent remedy, inasmuch as it divides the vessels that are implicated. It may be executed by the shoulder of a lancet, and one or two deep incisions may be made.

Along with blood-letting, general and topical, cathartics may be employed with great benefit. They excite a revulsion towards the intestinal canal, and are thus doubly beneficial as depletives and revellents. Where the constitutional and local symptoms run high, it may be advisable, also, to administer the tartrate of antimony and potassa, so as to excite and keep up nausea.

R.—Antim. et potass. tartrat. gr. ij.
Mucilag. acac. ℥ij.
Aquæ, ℥iv.—M.

Dose, a tablespoonful, every three hours.

At a later period, when the activity of the inflammation has somewhat passed away, the repeated application of a couple of leeches to the septum narium of the affected side often affords essential relief.

In regard to topical applications, it will generally be found, that the warm and soothing are the best at the commencement of the inflammation, when the excitement of vessels predominates over the over-distended or atonic condition of the extreme vessel. Warm milk and water, or flaxseed infusion, or the infusion of the pith of sassafras will answer every purpose. A decoction of poppy heads, or of the leaves of stramonium, has also been used, but it may be questionable whether it exerts any great influence, otherwise than by the warmth. With these decoctions the eyelids may be fomented, and the steam from them may be allowed to enter the eye; but no force should be used to make the fluid come in contact with the conjunctiva.

When there is any purulent secretion from the conjunctiva, the eyes become glued together during sleep, and increased irritation may be induced by endeavouring to separate them. This may be prevented by penciling the eyelids, on retiring to rest, with any mild ointment, or with butter from which the salt has been washed;

but should this precaution not have been adopted, and the lids be united, the bond of union may be softened by the same ointment, or by washing the eyelids with warm milk and water.

When the inflammation is subacute, or the active stage has passed away, collyria, of a slightly excitant character, may be employed. Those, most commonly used, are solutions of the corrosive chloride of mercury,¹ nitrate of silver,² sulphate or acetate of zinc,³ acetate and subacetate of lead,⁴ sulphate of alumina,⁵ &c.

¹ R.—Hydrarg. chlorid. corros. gr. i.
Ammoniæ muriat. gr. iv.
Aquæ, seu Aquæ rosæ, ℥viii.
—M.

³ R.—Zinci sulphat. gr. i.—vj.
Aquæ, ℥j.—M.—Or,
R.—Zinci acet. gr. i.—ij.
Aquæ, ℥j.—M.—Or,
R.—Zinci sulphat.
Plumb. acet. āā gr. vj.
Aquæ, ℥j.—M.

² R.—Argent. nitrat. gr. j.—iv.
Aquæ destillat. ℥j.—M.

⁴ R.—Plumb. acet. gr. ij.—vj.
Aquæ, ℥j.—M.—Or,
R.—Liq. plumb. subacet. gtt. xij.
Aquæ, ℥ij.—℥iv.—M.

⁵ R.—Alumin. gr. v.—xv.
Aquæ, ℥iv.—M.

To be filtered, or used without shaking.

An ointment of the red precipitate¹ may also be applied by means of a pencil to the eyelids at the time of going to rest.

¹ R.—Hydrarg. oxid. rubr. gr. iss.
Unguent. cetacei, seu
——— simpl. ℥iss.—M.
Or, R.—Unguent. hydrarg. oxid. rubr. ℥j.
——— cetacei, seu
——— simpl. ℥ij.—M.

A collyrium of the chloride of lime has likewise been used with advantage. (*Farvagnié.*)

R.—Calcis chlorur. gr. iv.—vj.
Vin. opii, gtt. x.
Mucilag. acac. ℥iss.
Aquæ rosæ, ℥ij.—M.

A little to be dropped into the eye occasionally.

In long protracted inflammation of the eye, when the vessels remain turgid, more powerful excitants are often needed. These may consist of the agents prescribed above, but in larger proportions. In one case, the author knew the inflammatory action disappear, on holding heated charcoal near the eye, as long as it could be borne; the caloric excited the over-distended vessels to contraction, so that they were restored to their former calibre, and thus the inflammation ceased along with the turgescence or hyperæmia that occasioned it.

The vinum opii of the pharmacopœias has been found serviceable in similar cases,—two or three drops being introduced into the eye every morning, or every night and morning, until the redness disappears.

It is in the subacute, in the chronic, and in the later stages of every variety, that revellents—as blisters behind the ears or to the nape of the neck—are most markedly beneficial.

The application of a blister, seton, or issue to the arm is often had recourse to, especially where the disease is apt to recur; and the revulsion, thus established, is often decidedly serviceable.

In chronic cases, it is advisable to examine frequently into the condition of the tunica conjunctiva lining the eyelids; and if they be rough and sarcomatous, it may be necessary to scarify the lining membrane, or to touch it lightly with the solid sulphate of copper, or the solid nitrate of silver.

Throughout the disease, especially if violent, the light should be totally excluded; or, if less severe, the eyes may be covered with a shade; and it is important, that both the sound and the affected eye should be protected from the light, as great consent exists between the two organs.

Many cases of simple inflammation of the eye are kept up by a peculiar condition of debility, without any important functional derangement. These are often greatly benefited by change of air. (*Tyrrell.*)

2. *Purulent Inflammation of the Conjunctiva.*

SYNON. Ophthalmia purulenta, Blennophthalmia, Blennorrhœa oculi; *Fr.* Ophthalmie purulente, O. puriforme; *Ger.* Augenblennorrhœe, Schleimfluss der Augen.

Purulent ophthalmia occurs under three forms,—the two first, however, are in reality the same disease; and the third is merely produced by a specific cause;—*first*, the purulent ophthalmia of the adult; *secondly*, that of the new-born child; and, *thirdly*, the gonorrhœal; each of which may require a distinct consideration.

a. *Purulent Ophthalmia of the Adult.*

SYNON. Ophthalmia purulenta epidemica, O. epidemica, O. Ægyptiaca, O. contagiosa, O. bellica, O. Asiatica, Blennorrhœa oculi Ægyptiaca, Ægyptian ophthalmia or ophthalmia.

This serious affection, which has been the scourge of armies at different times, and which prevailed most disastrously in the British armies in Egypt about the commencement of the present century, is commonly considered distinctly by ophthalmologists, although it is regarded by some as merely an aggravated form of catarrhal conjunctivitis. Some idea may be formed of its ravages from the fact mentioned, that the British hospitals of Chelsea and Kilmainham contained at one time *two thousand, three hundred and seventeen soldiers* totally blind in consequence of this disease. (*Littell*, of Philadelphia.)

Diagnosis.—The symptoms of purulent ophthalmia may not differ at first from those of the catarrhal form; but soon, a copious viscid secretion takes place from the inflamed conjunctiva, which is at first mucous, but afterwards decidedly purulent,—the eyelids are greatly tumefied, and their inner surface uniformly vascular. In very severe cases, the conjunctiva, covering the sclerotica, is so much tumefied as to form a *bourrelet* or ring around the transparent cornea, which, at times, scarcely permits the cornea to be seen.

To this condition the term *chemosis* is applied. Owing to the like turgescence, the lower eyelid is occasionally everted, and the conjunctiva seen protruding; but these are severe cases.

Whilst the inflammation is confined to the conjunctiva, the pain may not be great; but as soon as it involves the deeper seated parts, which do not readily admit of distension, it is at times excessive. Generally, it is felt chiefly in the orbit, and is of an aching, pulsative character, subject to occasional exacerbations.

Under such severe irritation, the constitution sympathizes greatly, and there is often much fever: if the disease, too, persists for any length of time, the health always suffers. It is very liable to relapse, and even if resolution takes place, the inflammation may give occasion to various morbid conditions of the eye and its appendages,—as vascular thickening of the conjunctiva lining the eyelids, with enlargement of its mucous follicles, commonly called *granular conjunctiva*, opacity, sloughing, staphyloma of the cornea, or prolapse of the iris, or suppuration and collapse of the eyeball.

Rupture of the cornea sometimes takes place during the violence of the pain. This may occur at an uncertain period from the commencement, and affords some relief; but, at other times, it does not even seem to check the progress of the disease.

At times, the inflammation becomes chronic, and a thin gleet discharge or *blennorrhœa* takes place, with more or less pain, and a roughened condition of the palpebral conjunctiva, which may ultimately impair or wholly destroy vision.

Causes.—Purulent ophthalmia is not unfrequent in this country, but it never proceeds so rapidly, or passes to others with the same facilities as in warm climates. Opinions have differed materially on the point of its communicability; some—as already remarked—believing it to be merely an aggravated form of catarrhal ophthalmia, whilst others suppose it extends by specific contagion. Most writers, however, believe, that the morbid matter, applied to the sound eye of another individual, is capable of inducing the disease. Sentiment has varied and still varies in respect to its communicability by any emanation from infected eyes: some have denied this altogether, (*Vetch*;) others believe in the affirmative; and others think it doubtful. (*Mackenzie*.) It has been properly observed, however, that in practice, it is safest to esteem it contagious, and to avoid the employment of anything that would be capable of communicating the disease, just as if its contagious nature were wholly established. (*W. Lawrence*.)

Treatment.—The general management of this form of ophthalmia is the same as that of the catarrhal. It is important to subdue the inflammation as speedily as possible; and, accordingly, the lancet should be freely employed, and again and again, should the symptoms demand it; always bearing in mind, however, that the disease, if not subdued, may pass into the chronic form, and hence that the active powers of the constitution may be needed subsequently.

In regard to scarifying the swollen conjunctiva, discrepancy has existed amongst therapeutists,—some advising deep incisions, (*Mackenzie*;) others considering them improper in cases of acute ophthalmia, (*Lawrence*;) whilst others advise excision of large portions of the chemosed membrane, (*Walther*;) and others, its entire removal, cauterizing the bleeding surface with lunar caustic in substance. (*Sanston*.)

Leeches, cupping and cathartics may be employed here, on the same principles as in simple inflammation of the conjunctiva; and different revellents may be prescribed, after the antiphlogistics have been premised. The local treatment, during the period of active inflammation, must, likewise, be similar; but, after the urgent stage of excitement has been subdued, it will be advisable to employ more powerful topical excitants. It is in these cases, that the solid nitrate of silver has been applied to the inner surface of the palpebræ every one or two days;—a solution of the nitrate being dropped occasionally into the eye in the interim.

R.—Argent. nitrat. gr. iv—x.
Aquæ destillat. ℥j.—M.

Any of the excitant washes, before recommended under simple inflammation of the conjunctiva, may be, likewise, used in the interim. A collyrium of alum is often prescribed with this view.

R.—Alumin. gr. vj—x.
Aquæ, ℥j.—M.

The ointment of the red oxide of mercury may also be used in its officinal state, or reduced by lard, should it excite irritation. Various stimulating substances have been advised in protracted cases—as the undiluted liquor plumbi subacetatis, and the oil of turpentine. (*Vetch*.) It is in such cases, that the alum curd has been highly advantageous.

R.—Pulv. aluminis, ℥ss.
Album. ovi.

Agitate them well, until a coagulum is formed; which may be applied on a linen rag.

A modern writer (*Sonty*) has found great advantage from this agent,—a few drops of the liquid being also dropped into the eye repeatedly through the day, in some cases, every half hour.

When the pain is very intense, or suppuration has taken place, and rupture of the cornea is apprehended, it has been advised to puncture the cornea, and discharge the aqueous humour. This has frequently been done, and apparently with good effects. (*Sir James McGregor*.) It has been advised, by some, to attempt an ectrotic method, by applying strong astringents to the inflamed membrane from the very first, especially where the inflammation is confined chiefly to the palpebral conjunctiva. In such case, the nitrate of silver is, perhaps, the best agent that could be employed.

Should the affection occur in unhealthy or debilitated habits, sedatives may be inappropriate; and along with the local excitants

already mentioned, it may be necessary to have recourse to quinia, iron, &c. The iodide of iron may be a useful preparation in such cases.

b. *Purulent Ophthalmia of new-born Children.*

SYNON. Ophthalmia purulenta infantum, O. neonatorum, Blepharophthalmia neonatorum, Blepharoblennorrhœa neonatorum, Lippetudo neonatorum, Blennorrhœa oculi neonatorum; *Fr.* Ophthalmie puriforme des nouveau-nés; *Ger.* Augenentzündung Neugeborener.

This affection is generally seen within the first three or four days after birth, and may be caused by the contact of acrid secretions with the eyes of the child in its passage through the parts of the mother, but this is not regarded by some as a common cause. (*Sichel.*) It may, however, be induced by irritants of various kinds after the child has been born.

The symptoms are essentially those of the purulent ophthalmia of the adult,—a copious secretion of thick purulent matter, not unfrequently mixed with blood, extreme injection of the conjunctiva, chemosis, intolerance of light, and swelling of the eyelids.

The disease may be confined to one eye, but the author has more commonly seen both affected simultaneously.

Generally, the affection eventuates favourably; but, in severe cases, it may occasion loss of sight; either by depositions of coagulable lymph occurring between the layers of the cornea, or by ulceration of the cornea, or suppuration of the globe of the eye. If the cornea still retains its transparency, however violent the inflammation and profuse the discharge, the sight may be preserved, although the cure may be tedious, if the disease has been allowed to establish itself. (*R. H. Taylor.*) If the effused matter has not had time to become organized, vision is occasionally restored in cases where, from the extent of the opacity, recovery may have appeared quite hopeless. (*Littell*, of Philadelphia.)

Treatment.—The general principles of management are the same as in the like variety of ophthalmia in the adult. In slight cases, and it fortunately happens, that the generality of them are of this character, it may be sufficient to wash the eyelids with warm milk and water, and to apply a little simple ointment, lard, or butter from which the salt has been removed by washing, by means of a camel's hair pencil. It has been advised—as a preliminary measure—"to ascertain distinctly the actual condition of the affected organ, and especially the progress, which the inflammation has made with reference to the transparent parts," (*R. H. Taylor*;) but the irritation, produced by the attempt, has been to the author a striking objection; and, accordingly, he rarely strives to inspect the globe of the eye, and has never had occasion to regret his caution. The course, advised as the best for inspecting the organ, by placing the points of the fingers against the anterior edges of the tarsi, and pressing them firmly but gently backwards over the globe, (*Mackenzie*;) cannot fail to prove more or less injurious, and moreover—as remarked by those who recommend it—is not

always sufficient; for we are told, that "if we fail in obtaining a view of the cornea, we must rest satisfied with what information can be obtained from the external condition of the lids, and the nature of the discharge, which issues from beneath them." (*R. H. Taylor.*)

The same lotions may be applied to the eye, as advised in the forms of ophthalmia already considered; but they must, of course, have their strength reduced; and, if the parts be turgid, scarification, with one gentle stroke of the lancet, may be practised on the hyperæmic vessels.

Should there be a threatening of disorganization of the cornea, and, along with this, concomitant symptoms of want of tone, it may be advisable to administer tonics—as the sulphate of quinia.

R.—Quiniæ sulphat. gr. iv.

Syrup. simpl. ℥ij.—M.

A teaspoonful, four or five times a day.

If the conjunctiva remains relaxed, it has been recommended, during the decline of the disease, to touch it daily with the vinum opii; or if it presents a sarcomatous or granular appearance, to apply the solid nitrate of silver.

c. Gonorrhœal Inflammation of the Conjunctiva.

SYNON. Ophthalmia gonorrhœica, Blennorrhœa oculi gonorrhœica, Conjunctivitis blennorrhagica, C. Gonorrhœica, Gonorrhœal ophthalmia; *Fr.* Ophthalmie blennorrhagique, Conjonctivite blennorrhagique, *Ger.* Augentripper, Tripperartige Augenentzündung.

This does not differ from severe forms of ordinary purulent ophthalmia, except by its violence constituting *hyper-conjonctivite*, (*Piorry*,)—and the specific nature of its cause. The history of the case, alone indeed, indicates its character. It seldom attacks both eyes at once; and when it extends from one to the other, it is supposed to be from the matter of the eye first affected being applied to the other.

There is no doubt, that the contact of gonorrhœal matter induces it; but it is more than questionable, whether it ever arises metastatically, as has been said by some. Evidence is certainly wanting to establish the fact. It is singularly violent and destructive,—generally terminating, in spite of every care, in ulceration, sloughing or opacity of the cornea, or by suppuration, bursting and collapse of the eyeball, obliteration of the anterior chamber, and flattening of the eye, staphyloma, prolapsus of the iris, obliteration of the pupil, &c. &c. (*Lawrence.*)

Treatment.—As already remarked, success may not follow the best directed efforts. The treatment, however, must be the same as in severe cases of purulent ophthalmia in the adult—antiphlogistic measures pushed freely, blood taken both generally and locally, and the use of the solid nitrate of silver at a very early period; as soon, indeed, as the different antiphlogistics have been employed in rapid succession. No time is to be lost, and if the nitrate is to be of benefit, it must be applied early.

A milder form of gonorrhœal inflammation of the conjunctiva has been described, which readily yields to the astringent plan of treatment, and rarely requires antiphlogistic measures, unless in patients of a full habit. (*Lawrence.*)

3. *Strumous inflammation of the conjunctiva.*

SYNON. Ophthalmia scrophulosa, Scrophulous or strumous ophthalmia, Conjunctivitis scrophulosa; *Fr.* Ophthalmie scrophuleuse; *Ger.* Scrophulöse Augenentzündung.

Scrophulous ophthalmia is not uncommon, although by no means so often met with in this country as in Great Britain, where nine-tenths of the cases that occur in early life are supposed to be of this character. Like scrophula itself, this form is most common in childhood. It is seated primarily and essentially in the conjunctiva and meibomian follicles; whence, like other varieties of conjunctivitis, it may spread to the sclerotica, the iris, or the cornea.

Diagnosis.—In this variety, the conjunctiva is not so vascular as in the catarrhal or purulent forms; the redness is often indeed confined chiefly to the tarsi and the conjunctiva lining the eyelids; yet there is great dread of light and lachrymation, so that the child is afraid to open the eyes, and every attempt to examine them is attended with spasm of the orbicularis muscle, and a copious secretion of tears.

The injected vessels generally direct their course to the margin of the cornea, over which they pass, terminating towards its centre; and, at their extremities, small pimples containing a clear or yellowish fluid form, which soon burst, and a small infundibuliform ulcer results. These pimples are occasionally seen, also, where the sclerotica joins the cornea.

The degree of pain is not often great whilst the eyes are shaded from the light, but should the inflammatory phenomena be considerable, it is frequently urgent, especially during the night. The secretion from the eyes, in passing over the cheeks, gives occasion to redness of the integument, and the nostrils are often greatly irritated.

Along with these local symptoms, the constitution may be more or less affected; and there is especially gastric or intestinal irritation.

Towards evening, especially after sunset, considerable remission of the symptoms takes place, which had been aggravated during the day,—a phenomenon, which is not observed in any of the other forms of ophthalmia. (*R. H. Taylor.*)

This variety is more insidious than those already considered; and, not unfrequently, changes take place in the transparent tissues, before any danger to the organ is apprehended. All the organic lesions that succeed to the other varieties may equally supervene in this. It may terminate in ulceration of the cornea, opacity from thickening of the pustule, or from interstitial deposition; adhesion of the iris to the cornea, staphyloma, &c.

The disease is very liable to relapse from slight causes, and it is affirmed, that frequent and long-continued attacks generally leave

the eyes in an imperfect condition, and predisposed to become amaurotic, from causes, which might have been applied with impunity under other circumstances.

Under the name *Pustular ophthalmia*, a form of strumous inflammation of the eye has been described, which differs, in some respects, from that just noticed. (*Mackenzie*.) It is characterized by the formation of pustules, generally of considerable size, which are filled with a yellow opaque matter, and are usually seated a line or two distant from the margin of the cornea: these burst, and are converted into broad elevated ulcers. It is often combined with catarrhal conjunctivitis. The intolerance of light, in simple cases, is generally slight; and the spasmodic contraction of the orbicularis, so frequently seen in ordinary strumous conjunctivitis, is never observed.

The subjects of it are generally children of a somewhat advanced age, or young adults. It is not attended with danger to the transparent parts of the eye, and generally yields readily to simple treatment. (*Mackenzie, R. H. Taylor*.)

Causes.—The predisposition is the strumous diathesis. The exciting causes are those of conjunctivitis in general. It is not an uncommon sequel of eruptive fevers and hooping-cough.

Treatment.—Scrophula being—as elsewhere shown—an imperfect condition of the system, it can scarcely happen, that powerful antiphlogistic measures are needed in this manifestation of it. Even local blood-letting is rarely required. Cathartics are almost always advisable, and, throughout the affection, attention may be required to the condition of the alimentary canal. After the action of cathartics, tonics are often found highly serviceable. An eminent writer on diseases of the eye, already cited, (*Mackenzie*), strongly recommends the sulphate of quinia. “In most of the little patients”—he remarks—“to whom I have administered sulphate of quinine, it has acted like a charm, abating commonly in a few days the excessive intolerance of light and profuse epiphora, promoting the absorption of phlyctenulæ, and hastening the cicatrization of ulcers of the cornea.”

By some, it has been advised to administer mercurials so as to affect the mouth; but the policy of this course is questionable in every form of scrophulosis; and, besides, mercurial ptyalism in young children is often extremely troublesome, and attended with disagreeable results. The preparations of iodine are far preferable; almost every form, indeed, of revulsion is beneficial; hence counter-irritation, by means of blisters behind the ears and between the shoulders, renewed at intervals, is an excellent remedial agency. After the disease, too, has persisted for some time and remains stationary, great advantage is often derived from change of air.

A light nutritious diet should be enjoined throughout the whole course of the disease.

In regard to local agencies, scarification of the eyelids may, at times, be practised with advantage. Hot fomentations generally

afford considerable relief; and warm bread and water poultices during the night are extremely soothing. In other cases, the various astringents and gentle excitants, advised in simple inflammation of the conjunctiva, may be used as collyria,—especially the solution of nitrate of silver, and, according to some, the vinum opii. Should ulcers exist on the cornea, the finely pointed nitrate of silver may be applied; or a stronger solution of the nitrate of silver, by means of a camel's hair pencil. The ointment of red precipitate, before advised, may also be applied to the edges of the eyelids, at bedtime.

The hydrocyanic acid has been used in such cases, especially where there is engorgement of the conjunctiva, as a collyrium, with advantage. (*Elwert.*)

R.—Acid. hydrocyan. gtt. ij.

Aquæ, ℥ij.—M.

A little to be dropped frequently into the eye.

The iodide of zinc has likewise been recommended. (*Proutet.*)

R.—Zinci iodid. gr. xv.

Aquæ destillat. ℥vj.—M.

It is not necessary, in this form of conjunctivitis, to keep the patient in a dark room. It is generally sufficient to direct a broad green shade; and exposure to the air, when the weather permits, is always of benefit. In cases of *vascular speck*, which is an opacity of the conjunctival layer of the cornea, with red vessels running into it, the removal of a portion of the enlarged vessels, which supply it, is one of the best means for arresting its progress.

The pustular form of strumous conjunctivitis, before alluded to, may be treated by touching the pustules or ulcers daily with solid caustic, or a strong solution of nitrate of silver. This generally proves sufficient: where it does not, it has been advised to give the precipitated carbonate of iron, in the dose of ten to twenty grains daily. (*R. H. Taylor.*)

4. *Variolous Inflammation of the Conjunctiva.*

SYNON. Ophthalmia variolosa, Variolous ophthalmia; *Fr.* Ophthalmie varioleuse; *Ger.* Variolöse Augenentzündung.

Variolous pustules may form upon the conjunctiva as upon any portion of the cutaneous surface. Such, at least, is the common opinion; but it is not the view of some observers, (*G. Gregory, Guersent, Marson,*) who consider that the eye suffers, in smallpox, from common inflammation merely, although of a very severe form. Of course, the most dangerous position is over the corneal layer. The pustule appears, at first, in the shape of a small white point, which gradually becomes elevated and yellow; and, in spite of every care, vision may be either wholly lost, or impaired by opacity or ulceration. Where suppuration or sloughing of the cornea occurs, it may be followed by the various lesions of the eyeball, more than once referred to.

Sometimes *secondary variolous ophthalmia* occurs at the time

when the pustules are disappearing from other parts of the body. It is milder than the variolous conjunctivitis above described, but still may be attended with mischief. It seldom, however, terminates in destruction of the cornea: opacities are much more likely to be left. The period of the attack varies from two to six weeks after the apparent termination of the primary complaint.

Treatment.—This must be the same as in all severe cases of ophthalmitis. General bleeding may be required, or if not, it may be advisable to take blood locally. When the pustules form, they should be opened early, and be freely cauterized with the solid nitrate of silver. (*Serres, Sichel.*) The same application is advisable when they burst.

The secondary form of variolous inflammation may require topical bleeding and purgatives, in the first instance; but, afterwards, an opposite plan is generally advisable, and the sulphate of quinia alone, or associated with other tonics, may be indicated. The vinum opii and the solution of nitrate of silver, or the solid nitrate of silver, are amongst the best topical applications.

b. INFLAMMATION OF THE SCLEROTICA.

SYNON. Inflammatio scleroticæ, Sclerotitis, S. atmospherica, Rheumatic ophthalmia, Rh. Sclerotitis; *Fr.* Sclérotite; *Ger.* Entzündung der weissen Augenhaut.

Inflammation of the sclerotic coat of the eye does not often exist alone; being either accompanied, from the first, or speedily followed, by conjunctivitis. The iris and cornea suffer to a certain extent, although, unless from neglect or mismanagement, serious alteration of structure in either is not common.

Diagnosis.—There is a general bright redness of the globe of the eye, especially around the cornea, towards the margin of which the radiated vessels of the sclerotica are seen advancing, and, along with those derived from the conjunctiva, passing over the cornea to the extent of about half a line, forming a fine vascular wreath, which encircles the cornea wholly or in part, and in which all the vessels are observed to terminate with sharp points, and at an equal height; none pass beyond it, the rest of the cornea remaining free. This arrangement and mode of termination of the vessels has been considered characteristic of *rheumatic sclerotitis*. (*Jüngken, R. H. Taylor.*)

In the progress of the inflammation, the iris becomes implicated, as indicated by contraction of the pupil, easily seen by comparing the sound with the affected eye; the iris is less active, also, than usual. The capsule of the aqueous humour is likewise affected, giving occasion to haziness of the cornea. The pain of the eyeball is severe, and of a stinging or darting character, extending to the orbit, forehead, cheek, and occasionally along the branches of the fifth pair of nerves to the face. The pain is usually increased by warmth, and is especially severe from sunset to sunrise.

There is always, along with those symptoms, a considerable secretion from the eye; but, instead of its being mucous, as in in-

inflammation of the conjunctiva, it consists of the secretion from the lachrymal gland. Photophobia or intolerance of light is always present, but it varies in degree in different cases. The same may be said of the constitutional irritation; fever is almost always present, but, at times, to a much greater degree than at others.

The inflammation is often restricted to one eye, and frequently alternates with rheumatic affections in other parts of the body. It also leaves a strong predisposition to a recurrence on the application of slight causes.

The disease is not often seen in children and old persons.

Treatment.—The treatment of scleratitis should be active, especially if the patient be plethoric, and there be much constitutional irritation. Blood may have to be taken from the general system, and the operation may be repeated again and again, unless the symptoms are relieved. Cupping and leeches and blisters may also be used, as in the forms of ophthalmia already considered. Cathartics may be prescribed as revellents, and calomel and opium be administered, so as to “touch” the mouth gently.

R.—Hydrarg. chlorid. mit.

Pulv. opii, āā gr. j.—f. pil.

To be taken morning and evening.

In regard to local applications, they should generally be used warm. They may consist simply of warm water, or warm milk and water; or warm decoction of poppy-heads. Warm opiate frictions have been advised to the temple and forehead, with the view of averting, or relieving, the nocturnal paroxysm of pain. Warm laudanum, or warm wine of opium, may be used for this purpose, or a liniment of soap with opium:

R.—Linim. sapon. comp. ℥j.

Tinct. opii, ℥ss.—M.

It has been advised, that these opiate frictions should be used especially about an hour previous to the expected attack.

Applications to the eye, in the form of collyria, have not been found of much service, and those that are excitant are injurious during the early stages. When, however, the acute symptoms have passed away, and *à fortiori*, when they become chronic, the vinum opii—pure, or diluted—dropped between the eyelids, is often beneficial. In such cases, too, especially when they are associated with evidences of a strumous diathesis, tonics, as the sulphate of quinia, or arsenic, may be successfully administered.

Throughout the whole course of the disease, the iris should be kept under the influence of belladonna.

At times, the catarrhal and the rheumatic varieties of ophthalmia are combined, constituting *catarrho-rheumatic ophthalmia*; the presence of which may be diagnosticated, from a knowledge of the functional phenomena exhibited by the two varieties respectively. The cornea is very liable to suffer in this form of ophthalmia from

ulceration, abscess, or interstitial deposition; or the inflammation may extend to the iris, so as to terminate in the effusion of lymph, and in obliteration of the pupil.

More activity of treatment is required than in sclerotitis; and in addition to the remedies advised under the latter affection, the employment of the local agents recommended in the catarrhal variety is demanded.

C. INFLAMMATION OF THE CORNEA.

SYNON. Inflammatio corneæ, Corneitis, Keratitis, Ceratitis; *Fr.* Kératite, Inflammation de la Cornée transparente; *Ger.* Entzündung der Hornhaut.

Inflammation of the cornea—as has been already remarked—is apt to form a part, by extension, of the different forms of inflammation of the eye, that have already received attention. Ceratitis proper, however, commences in the cornea, whence it may spread so as to attain other tissues. In many cases it is simple, as where it has been caused by any extraneous substance, as a particle of metal imbedded in the substance of the cornea; or, what is considered by some to be more common, it originates frequently in the scrophulous diathesis, and has been thought to merit the distinctive appellation of *strumous corneitis*.

Diagnosis.—The disease generally commences slowly, and insidiously, and the cornea loses its natural brilliancy, and becomes dull and hazy,—the surface appearing as if covered with fine dust, or resembling glass that has been breathed upon; and, at a later period of the disease, it seems studded with minute depressions. The fine vessels of the conjunctiva and sclerotica become injected;—those of the sclerotica, which is the principal seat of increased vascularity, being arranged in radii around the cornea, and presenting a carmine hue: occasionally, too, the vessels are so numerous over the corneal epidermis, as to form a vascular net-work, which covers the entire surface, and has been termed *Pannus*.

The pain, attending inflammation of the cornea, may be acute in the early stage, and be accompanied by photophobia and by lachrymation. As in other cases, too, it may come on in paroxysms. In the chronic stage, it is not violent; often, indeed, it is slight.

The terminations may be like those of other forms of ophthalmia,—for example, interstitial deposition; ulceration; protrusion of the iris; obliteration of the pupil; immobility of the iris; adhesion of the iris to the cornea, &c. &c.

In all cases, the prognosis ought to be guarded; yet, division of the membrane by the knife of the surgeon generally heals without any inconvenience, as in the operation for cataract by extraction; and in cases of penetrating and other wounds of the cornea, we often see surprising recoveries.

Treatment.—In this, there is nothing peculiar. The general management, advised under simple and strumous inflammation of the conjunctiva, is equally appropriate here. Full antiphlogistic measures may be required in the acute stage; but it must be borne

in mind, that the inflammation is apt to pass into the chronic form; when revellents—as blisters behind the ears, occasional cupping on the nape of the neck, and mercury administered so as to produce a revellent impression on the mouth, with or without tonics, as the case may seem to require, will be most serviceable.

Where the ceratitis is of some standing, it is commonly accompanied by increased secretion of the aqueous humour, so that the cornea becomes more convex than natural. In such case, it has been proposed to evacuate the humour by puncturing the cornea, with the view of relieving the painful sense of distension; and it is said to have been practised with advantage by several practitioners. (*Jünken, Wardrop.*)

The sulphate of quinia, in conjunction with collyria of nitrate of silver or sulphate of zinc, is said to evince frequently a remarkable control over vascular albugo, or that form of the disease, which is characterized by lymphatic deposition. (*Littell, of Philadelphia.*)

d. INFLAMMATION OF THE IRIS.

SYNON. Iritis, Inflammatio iridis; *Fr.* Irite, Irisite, Inflammation de l'Iris; *Ger.* Entzündung der Regenbogenhaut des Auges.

The iris may be inflamed in consequence—as has been seen—of the extension of inflammation from other parts of the eye, but it may be inflamed also idiopathically; and, again, the inflammation may be modified according to syphilitic, arthritic, or other complications. Hence, various divisions of iritis have been made; but these are scarcely necessary, inasmuch as they are indicated only by a knowledge of the history of the case, or a careful examination of the patient.

Diagnosis.—Inflammation of the iris, whatever may be its cause or complication, presents certain phenomena, some of which belong to itself; others are common to it and other forms of ophthalmia.

Those that belong to the iris are loss of its usual brilliancy, and change of colour,—the change being owing either to the admixture of red vessels with it, or to an effusion of plastic lymph—the result of the phlegmasia;—hence, a light coloured iris becomes greenish or yellowish; blue is converted into green; or, if dark coloured, it presents a reddish tinge. If, however, the inflammation be seated in the serous covering of the iris—*Iritis serosa*—the colour is not changed, but is modified by the appearance of a pale grayish coat, which gives a dull aspect to the membrane. In serous iritis, consequently, a blue iris may remain blue; but the colour is rendered dull. The structure of the iris also exhibits change; its fibrous texture is no longer observable, and tubercles or abscesses may form in its substance. It also loses its contractility, so that the pupil remains unchanged in size when exposed to different degrees of light, and is generally contracted.

Along with these pathognomonic symptoms are many which belong both to it and to other inflammations of the eye. Thus, there is the zonular redness of the sclerotica, produced by numer-

ous vessels surrounding the cornea, and running towards its edge: adhesions may also form between the iris at its pupillary margin, and the capsule of the crystalline; and, in rare cases, it adheres to the posterior surface of the cornea, and more or less plastic lymph is effused into the anterior or posterior chamber of the eye, or into both, giving rise to imperfection of vision, and, at times, to total blindness. Photophobia, lachrymation, and deep-seated circum-orbital pain, generally aggravated at night, are present to a greater or less degree, according to the severity of the inflammation.

The constitutional disturbance is often very considerable, and the symptoms proceed at times so rapidly, that vision is destroyed in a few days.

Such are the main phenomena of iritis, whatever may be the cause or complication.

Causes.—Along with mechanical injuries, and other agencies concerned in the production of ophthalmia in general, may be reckoned,—a constitutional predisposition given by syphilis and scrophula, and, perhaps also, by gout and rheumatism; hence we have, in many works,—*acute idiopathic iritis, syphilitic iritis, rheumatic iritis, arthritic iritis, and strumous iritis*, as so many subdivisions.

Treatment.—The first object in a case of iritis is to subdue the inflammatory action, and prevent the effusion of lymph. General blood-letting should be prescribed immediately, and be repeated according to circumstances; blood may, at the same time, be taken from the nape of the neck by means of cupping; and along with this, cathartics, nauseating doses of tartrate of antimony and potassa, and the whole antiphlogistic treatment and regimen advised under the most acute forms of ophthalmia already considered, must be directed.

Where the disease is less severe, and the constitution of the individual such as to render it advisable to be cautious in the abstraction of blood from the general system, cupping may be trusted to, along with the general management and regimen already inculcated.

The most approved method of treatment—after blood-letting has been practised—is to administer mercury so as to induce a revellent influence on the system, under which effusions of plastic lymph are prevented,—or removed, if they already exist.

R.—Hydrarg. protochlorid. mit. gr. xij.

Pulv. glycyrrhiz. ʒss.

Conserv. rosar. q. s. ut fiant pil. xij.

Dose, one, every four hours.

The effect upon the system is sufficiently evidenced by its “touching” the mouth. In some cases, however, in which full salivation supervened, it appears to have acted like a charm. (*R. H. Taylor.*) Still, so many inconveniences are induced by ptyalism from mercury, that the remedy should not be pushed to this extent, if the disease will yield without it; and especial care should be taken on

this head, if the iritis be accompanied by a strumous constitution. In such case, mercury may still be demanded, but it should be administered if possible so as only to affect the constitution gently, and its agency be kept up for a length of time.

Should salivation supervene in any form of iritis, no farther good can, of course, result from the mercury, until its effects have subsided.

To relieve the circumorbital pain, frictions with any of the liniments recommended in the other forms of ophthalmia may be had recourse to. The following ointment has been strongly recommended, combining, as it does, a mercurial with an opiate.

R.—Ung. hydrarg. $\mathfrak{z}$ ss.

Pulv. opii, $\mathfrak{z}$ j.—M.

Eight or ten grains to the temple or forehead at night, previous to a paroxysm.

Collyria are of little or no benefit; and the various counter-irritants, employed in ophthalmia, are of service only after blood-letting has been actively premised.

The oil of turpentine has been strongly recommended as a repellent, where mercury is inadmissible. (*Carmichael*.)

R.—Ol. tereb. rectific. $\mathfrak{z}$ j.

Vitell. ovi.

Tere simul et adde gradatim,

Mist. amygd. $\mathfrak{z}$ iv.

Syrup. aurant. $\mathfrak{z}$ ij.

Tinct. lavand. comp. $\mathfrak{z}$ iv.

Ol. cinnam. gtt. iij. vel iv.—M.

Dose, two tablespoonfuls, three times a day.

The above formula is Mr. Carmichael's, but it is unnecessarily complicated, and a much simpler, and one equally efficacious, might be substituted—

R.—Ol. tereb. rect. $\mathfrak{z}$ j.

Vitell. ovi.

Tere simul et adde,

Aquæ menthæ piper. $\mathfrak{z}$ viss.

To prevent contraction of the pupil, the extract of belladonna may be smeared over the eyebrow once in twenty-four hours, or a filtered aqueous solution may be dropped on the conjunctiva. When cautiously used, it may gradually elongate the filaments of lymph that have formed between the iris and the capsule of the lens; and, with this view, its use may have to be continued for months.

In the iritis, which occurs in a constitution contaminated by the syphilitic poison, as well as in the other forms referred to,—the same general principles of treatment apply, and but slight modification is necessary. In the rheumatic, arthritic, strumous, and more chronic forms of idiopathic iritis, the sulphate of quinia is often beneficial, but it should not interfere with the other appropriate remedies, and especially with the calomel and opium.

e. INFLAMMATION OF THE CHOROID.

SYNON. Inflammatio chorioideæ, Chorioideitis, Choroiditis; *Fr.* Choroidite, Inflammation de la Choroïde; *Ger.* Entzündung der Gefäßhaut des Auges.

As an accompaniment of inflammation of other parts of the eye, choroiditis has been admitted by all writers on the subject; but it has not been described by all as an independent disease.

Diagnosis.—The following have been depicted as the functional phenomena of inflammation of the choroid. One of the earliest symptoms is the formation of a blue zone around the cornea: this is produced by thinning of the sclerotica, which is succeeded by the protrusion of small tumours of a dark bluish colour, and varying in size, number and position; a watery effusion forms gradually between the choroid and the retina, which produces absorption of the vitreous humour, and compresses the retina into a cord-like substance, simulating the appearance of deep-seated cataract or malignant tumour of the optic nerve. The pupil is often altered in shape, the iris immovable, and the cornea opaque; these symptoms arising from the simultaneous inflammation of those various parts. Enlargement of the globe of the eye likewise results at times, and morbid changes, which may render the extirpation of the organ necessary.

There is always more or less pain and intolerance of light; but the constitutional symptoms are generally inconsiderable.

Causes.—Of these we know little. It is a disease of the adult age, and is said to be more frequent in females than in males, and especially in those of a strumous habit.

Treatment.—This does not vary from that recommended in iritis. Mercury does not, however, seem to be decidedly beneficial. After active depletion, tonics, as the sulphate of quinia, have been found of great benefit, and as the disease frequently occurs in strumous habits, their use is generally indicated. The arsenite of potassa (*Liq. potass. arsenit.* gtt. v.—viii. ter die) has been advised, (*Mackenzie*;) the morbid appearances, in the advanced stage—it is affirmed—have disappeared under its use, and health and vision have been restored simultaneously.

When the eyeball is tense and painful, and there is a tendency to choroid staphyloma, puncturing the sclerotica and choroid, so as to evacuate the contained fluid, has afforded relief.

f. INFLAMMATION OF THE RETINA.

SYNON. Retinitis, Inflammatio Retinæ, Amphiblestroditis, Dietyitis; *Fr.* Rétinite, Inflammation de la Rétine; *Ger.* Entzündung der Netzhaut des Auges.

This is an uncommon affection, except as an accompaniment of other forms of ophthalmia.

Diagnosis.—As the retina cannot be seen, the existence of retinitis has to be inferred from disturbance of function. The intolerance of light is great; shining spectra of various kinds are seen, and there is a gradual impairment of vision: the iris is motionless, and the pupil greatly contracted, whilst the whole globe is highly

sensible to the slightest touch or movement. These symptoms are usually accompanied by deep-seated pain in the globe of the eye, which extends to the eyebrow, and is often very severe, and accompanied by symptoms of cephalitis. When the disease is acute, the febrile excitement is often very great.

Extensive disorganization of the internal structures of the eyeball is a common result; and purulent effusion sometimes takes place, which may augment to such a degree that the cornea gives way, the pus is discharged, and the eyeball collapses.

Acute inflammation of the retina is less seen than the chronic form, which is characterized by intolerance of light of different degrees; impaired vision, with ocular spectra, and, ultimately, by immobility of the iris. It has been considered one of the most common causes of amaurosis, and requires the revellent treatment recommended under that disease.

II. AMAUROSIS.

SYNON. Paropsis amaurosis, Immobilitas Pupillæ, Gutta serena, Cataracta nigra, Drop serena; *Fr.* Amaurose, Goutte sereine, Cataracte noire, Anopticonervie, (*Piorry*;) *Ger.* Schwarze Staar.

In the language of the pathologists of the day, amaurosis means partial or complete loss of vision from impaired sensibility of the retina. This may arise in two ways,—*first*, owing to disease primarily seated in some part of the nervous apparatus of vision, as the retina, optic nerve and encephalon; and *secondly*, sympathetically, owing to disease in other and, perhaps, distant parts of the system.

Diagnosis.—Where amaurosis occurs as a consequence of chronic retinitis, and this has been considered the most common cause of the disease, there is generally some degree of vascular excitement present; the patient complains of pain or uneasiness in the eye, with a sense of heat, dryness, and morbid sensibility to light; he is disinclined to use the eyes, and is frequently annoyed by ocular spectra—as *muscæ volitantes*, and the appearance of bright spots in front of the eyes. Interstitial deposition takes place into the membrane, and its sensibility becomes less and less, and ultimately vision is wholly lost. Frequently, along with impairment, there is great depravation of vision,—*hemiopia* being at times present, at others *diplopia*, and at others, again, the singular phenomenon of double vision with one eye. Strabismus, too, is not uncommon; and, occasionally, when the central portion of the retina is wholly insensible, the patient is still capable of seeing objects, that are situate laterally, with tolerable distinctness.

The ocular spectra that exist in amaurosis may likewise be present when there is no serious affection of the eye: thus, many healthy persons observe appearances of cobwebs; and of serpentine tubes, open, at times, at both extremities, which are dependent upon some modification in the blood-vessels of the retina, but which may

never interfere farther with vision. (See the author's *Human Physiology*, 4th edit. i. 218: Philad. 1841.)

In the majority of cases, there is pain, which may be confined to the eyes, or may extend to the head and face; frequently, however, it is rather an uneasy sensation of fulness and distension than of positive pain. It may be constant, too, or fugitive; and, in its recurrence, may observe regular periods.

When the eye is examined, the appearances may be distinct or equivocal. Usually, the pupil is dilated and immovable; or the movements of the oris are sluggish and limited; but instances occur in which there is regular contraction and dilatation of the pupil; and if one eye only be amaurotic, the pupil often dilates when the other is closed, and conversely; hence the propriety of the precaution, recommended in such cases, of closing the sound eye, whilst we examine into the condition of the other.

The humours of the eye may exhibit changes in their transparency; a greenish yellow opacity may be seen behind the pupil—*glaucoma*; or they may be altered in their consistence, so that the eyeball may feel softer than natural, which has been ascribed either to the partial absorption of its fluid contents, or to the breaking down of the membranous septa, by which the figure and position of the vitreous humour is maintained.

When amaurosis is combined with glaucoma, there may be some difficulty in distinguishing it from incipient cataract, but the opacity, in the latter disease, is of a milk and water hue, and appears immediately behind the pupil, by the margin of which it is bounded. In posterior capsular cataract, the opacity is deep-seated like that of glaucoma, but it differs from it in exhibiting striæ radiating from a central point, whereas the opacity in glaucoma is always uniform. In doubtful cases, too, it may be well to examine the eye by means of artificial light. If a lighted candle be held before an eye, the pupil of which has been dilated by belladonna, and on which there is no obscurity in the humours or their capsules, three images of the flame are perceptible,—two upright and one inverted—one of the former reflected from the cornea, and the other from the anterior part of the crystalline; the third inverted image being caused by the reflection from the posterior concave surface of the crystalline. It is obvious, that if the inverted image be observed, there can be no opacity on the posterior capsule of the lens or in the lens itself. (*Sanson, Hays*, of Philadelphia, *R. H. Taylor*.)

Where amaurosis is complete the countenance loses its expression, and there is a characteristic vacancy; the eyeball frequently has a tremulous, vacillating or rolling motion, and the air and gait of the patient is often peculiar.

The progress of the disease varies materially; and it may not be fully developed for months, or even years.

Causes.—These are very numerous. It would seem, that a predisposition to it is laid, at times, in organization; sometimes, also, it is congenital. Whatever depresses the nervous system generally,

may act as a predisposing cause; thus, it is ascribed to excessive venery; copious hemorrhage; undue lactation, and the long continuance of depressing passions. It has been observed, too, that frequent attacks of strumous ophthalmia in childhood have appeared to render the individual liable to amaurosis in after years, on the application of slight exciting causes. Period of life, also, seems to afford a predisposition; for although the disease may occur at all ages, it would seem to be more frequent in the age of virility.

As exciting causes may be reckoned,—over-exertion of the eyes, particularly in the examination of minute objects, or exposure of the eyes to bright light; hence the disease is more frequent in certain occupations than in others. It may arise also from mechanical injury; or from morbid conditions of the optic nerves, and the nerves of the fifth pair; or even from irritation of those nerves by a carious tooth. The nerve of sight is the optic; but it is incapable of executing its function, unless the fifth nerve—the nerve of general sensibility—is in a state of integrity: hence, amaurosis may result from injury or disease of either. (See the author's *Human Physiology*, 4th edit. i. 91: Philad. 1841.)

Amaurosis has likewise been ascribed to violent mental emotion, and to the effects of lightning, the rays of a tropical sun, &c.; but it is unnecessary to attempt the enumeration of all the circumstances that may directly or indirectly occasion it.

Treatment.—It is important, in all cases, to inquire into the causes that have given rise to the amaurosis, and the precise character of the pathological condition. Should it appear to be a chronic retinitis, it must be treated by cupping, and other revellents, and by the various agents recommended under Retinitis. Mercury has been especially advised, and it may be necessary that the system should be kept under its influence for weeks.

Should the affection seem to be connected with any morbid condition elsewhere, it must be combated by appropriate remedies; at times, especially in the temporary amaurotic affections of children, an emetic followed by a brisk cathartic will remove it. (*R. H. Taylor.*) In the debility succeeding profuse evacuations of any kind, or no matter how induced, the proper treatment will be obvious.

The main attention has been directed to the impaired condition or the local paralysis of the optic nerve itself: the general treatment rests upon the principles laid down under Partial Paralysis. Too often, however, all these are inefficacious.

The article most employed has been the strychnia. It may be given either internally or administered endermically—the latter being preferable. A blister may be applied to the eyebrow or the temple, and from one-sixth to one-fourth of a grain of the strychnia may be sprinkled on the blistered surface once a day until headache, pricking pains over the body, tremors, or tetanic twitchings are induced. Some writers have deposed to its greater or less success, (*Shortt, R. H. Taylor, Middlemore, Mart, Pétrequin,*) but

others, although they have used it in cases apparently the most favourable, have not seen a single instance of benefit from its employment. (*Tyrrell, Mackenzie.*)

Errhines have been advised, upon the notion, that by irritating the branches of the fifth pair, an excitant influence may be exerted on the retina; and that if the disease is connected with the fifth pair, still greater good may, perhaps, follow their employment; but no great reliance can be placed on them.

Acupuncturation, ammoniated lotions, moxas, blisters, and every form of counter-irritant have been used to the temples, behind the ears, or the back of the neck. A recent writer (*Magendie*) affirms, that he has treated many cases of incomplete amaurosis with success by galvano-puncturation. He fixed one needle in the frontal nerve, and another in the superior maxillary, making them communicate respectively with the poles of a galvanic pile of twelve pairs of plates, each six inches square. Whenever the contact was made, the patient experienced a painful commotion in the course of the nerves, and at the bottom of the orbit; the light became better appreciated; and the pupil contracted.

Similar results were obtained from the use of galvanism, by another observer, (*Hays*, of Philadelphia,) who considers it, when properly applied, as a valuable and effective remedy in certain forms of the disease; this was evinced not only in the improvement that followed its application, but in the fact, that the patient saw better whilst subjected to the galvanic action.

Dr. Hays found a Cruikshank's battery of fifty pairs of plates, three inches square—when in full activity—too powerful for the purpose, so that only one half, or two-thirds of the plates were usually employed. The connection was made by means of leaden wire conductors, to one end of which was soldered a slip of copper, and to the other a hemisphere of brass, the flat surface of which was filed into grooves crossing at right angles, so as to form a number of sharp points. Over these were tied thin discs of sponge, which were kept moist with a solution of common salt, and when it was desired to introduce strychnia into the system, the sponge, attached to the negative pole—and sometimes that attached to the positive pole also—was moistened with a solution of it.

When the whole force of the battery was not wanted, instead of placing the slips in the extreme cells, they were placed in cells more or less remote, according to the power required, and the force was readily regulated.

The galvanic current may be made to pass from the mastoid process to the superciliary ridge.

CHAPTER II.

DISEASES OF THE EAR.

SYNON. *Fr.* Maladies des Oreilles; *Ger.* Ohrenkrankheiten.

UNTIL of late years, the diseases of the ear were but little attended to by the profession, and, by almost common consent, they were allowed to pass into the hands of individuals calling themselves *Aurists*, many of whom were imperfectly educated, whilst the calling itself was regarded, by the profession, as little better than that of the *bonesetter*. Of late years, however, the subject has been investigated by competent individuals, (*Itard, Deleau, Kramer,*) and the treatment of these interesting affections has passed into the hands of regular physicians and surgeons, from which it ought never to have wandered. As, however, in the investigation and management of most aural diseases, various manipulations are demanded, they have been esteemed to belong rather to the domain of surgery; and their consideration, consequently, has been generally transferred to works on external pathology. There are, however, some pathological conditions of the organ, that cannot be passed over in this work; but, before proceeding to them, it may be well to refer briefly to the anatomical arrangement of parts that are implicated.

The organ of hearing may be divided into three parts: 1, the *external ear*, or that exterior to the membrana tympani; 2, the *middle ear*, the space contained between the membrana tympani and the internal ear; and 3, the *internal ear*, in which the auditory nerve is distributed. The two first of these may consequently be regarded as the physical portion of the organ of hearing:—the last as the nervous portion.

The *external ear*, it must be borne in mind, is lined by a prolongation of the skin, which passes into the meatus auditorius externus, and, becoming gradually thinner as it proceeds, is ultimately reflected over the outer surface of the membrana tympani. It is in this tegument, that the sebaceous follicles or crypts are placed, which secrete the cerumen. This humour sometimes accumulates in the meatus, and may be the source of deafness, as well as of irritation and inflammation of the membrane. The distance between the external aperture of the meatus and the membrana tympani is about an inch in the adult; and by raising the pavilion, so as to straighten the passage, and permit the rays of the sun to fall into the meatus, the membrane can be readily seen. This can be much better accomplished, however, by means of an appropriate speculum, by which, with the aid of the light of the sun, or that reflected from a mirror, the membrana tympani and meatus audi-

torius may be minutely examined, with the view of detecting any existing morbid condition. (*Kramer.*)

The external ear is, consequently, a *cul-de-sac*, formed by a prolongation of the common integument. It has no aperture of communication with the middle ear.

The *middle ear* or *cavity of the tympanum* is bounded externally by the membrana tympani, and internally by the internal ear. It communicates with the cells in the mastoid process of the temporal bone; and with the throat by means of the Eustachian tube. In the bony paries, forming the boundary between it and the inner ear, there are two foramina,—the *foramen rotundum*, and the *foramen ovale*; both of which are closed by membranes; and to the latter is attached one extremity of a chain of bones or *ossicles*, which passes from the posterior surface of the membrana tympani to the foramen ovale. In health, the Eustachian tube is pervious, and readily permits the passage of air to, and from, the middle ear. The whole of this cavity is lined by a mucous membrane, which is reflected over the membrana tympani proper, passes down the Eustachian tube, and commingles with that of the pharynx. This lining of the middle ear is, in reality, fibro-mucous in its character, having the functions, both of a mucous membrane and a periosteum.

Lastly, the *internal ear* is the most important part of the auditory apparatus; but it is of the least consequence to the therapist, as it is beyond the reach of his agencies. In it is distributed the auditory nerve, which enters the meatus auditorius internus in the petrous portion of the temporal bone, passes into the cavities of the internal ear, and terminates in the different parts of the membranous labyrinth.

Along with the portio mollis or the auditory nerve proper, the portio dura or facial nerve proceeds along the meatus auditorius internus, and passes through a foramen near the base, to gain the aqueduct of Fallopius, along which it proceeds, receiving the Vidian twig of the fifth pair, and giving twigs, containing motor and sensitive filaments, to different parts of the middle ear. It is the portio dura, which—as already seen—is concerned in one form of facial paralysis.

I. INFLAMMATION OF THE EAR.

SYNON. Otitis, Inflammatio auris; *Fr.* Otite, Inflammation de l'Oreille; *Ger.* Entzündung des Ohres.

Inflammation of the ear may affect either the *external*, the *middle*, or the *internal* ear, each of which cases it may be well to investigate separately. It may be convenient, also, to consider chronic otitis under a distinct head.

a. *Acute Inflammation of the External Ear.*

SYNON. Otitis externa, External otitis.

Diagnosis.—*Earache*—*Otalgia*, *Otodyne*, *Dolor aurium*, *Spas-*

mus aurium; Fr. *Otalgie*; Ger. *Ohrenschmerz*, *Ohrenzwang*—is an affection often met with in childhood; but adults are not exempt from it. It is extremely painful, but is rarely of any consequence. At times, it appears to be wholly neuralgic; but, at others, is connected with more or less otitis, and is occasionally followed by a purulent discharge.

Inflammation of the external ear is indicated by redness, tumefaction, pain and heat in some part of the external ear, accompanied by a mucous or purulent discharge from the meatus auditorius externus or from the surface of the pavilion.

The inflammation may be confined to the lining of the meatus, when it has received, from some, the name *Otitis catarrhalis*, (*Piorry*;) or it may affect the integuments of the pavilion, as in cases of frostbites or where inflammation of the skin has extended from other parts to it, as in cases of erysipelas faciei. The inflammation may, however, extend to the cellular membrane beneath the tegument and to the fibro-cartilage of the ear, giving occasion to abscess, sloughing of the fibro-cartilages, &c. Occasionally, too, as the result of external otitis, an abscess forms before the meatus auditorius externus, which breaks into the meatus, and requires attention, inasmuch as the pus that accumulates may exert a sinister influence on the neighbouring parts, and denude the bones and fibro-cartilages of the external ear. (*Roux, Piorry, Itard*.)

At times, in this form of otitis, the tumefaction of the ear is so great as scarcely to admit the entrance of a knitting-needle into the meatus.

Causes.—External otitis is often connected with the strumous habit; and a predisposition is afforded by dentition and by previous attacks. It is often caused by the introduction of extraneous bodies into the ear, and by picking the ear. Not unfrequently, too, it is induced by the extension of inflammatory and cutaneous affections of the neighbouring parts. It is not always, however, easy to appreciate the cause.

Treatment.—In regard to simple otalgia or earache, the physician is rarely consulted. Should the severity of the pain, however, be such as to require him to prescribe, and the signs of inflammation be slight, fomentations may be applied to the affected ear, and a little warm oil and laudanum be dropped into it. During the night, a soft poultice may be substituted for the fomentations. Generally, in cases of otitis of the external ear, it is not necessary to have recourse to any very active treatment. General blood-letting is certainly rarely required; but if there be great swelling and pain, it may be necessary; and also to take blood from the neighbouring parts by means of leeches. Cathartics may be administered, and a rigorous diet be enjoined.

Warm fluids—as milk and water—may be thrown into the meatus by means of a syringe; but the introduction of any substances that may irritate is objectionable. Where there is much burning pain in the meatus, warm fomentations may be applied

constantly to the ear and to the side of the head, and leeches behind the ear may be advisable. Revellents may likewise be applied to the nape of the neck or behind the ear. By a modern writer on diseases of the ear, (*Kramer*,) the tartar emetic ointment, rubbed on the mastoid process, is preferred. Should the inflammation be slighter, and seated deeply, gently astringent injections may be thrown into the meatus. An injection of the acetate of lead or of the sulphate of zinc may be used for this purpose.

R.—Plumb. acet. gr. j.—viiij.
Aquæ, ℥ij.—M.

Or,

Zinci sulphat. gr. x.
Aquæ, ℥ij.—iv.—M.

If the inflammation, in spite of every care, proceeds to suppuration, this ought to be forwarded, as far as practicable, by warm emollient poultices, kept constantly applied, until the abscess breaks; and, should the discharge become very fetid, the fœtor may be corrected by injections of the chloride of lime, &c. recommended under otorrhœa.

It need scarcely be said, that attention must in all cases be directed to the cause, and that this must be removed where practicable.

When the disease becomes chronic, the treatment advised under otorrhœa must be enjoined.

b. *Acute Inflammation of the Middle Ear.*

SYNON. Otitis interna, Internal otitis; *Fr.* Otite interne, O. tympanique.

Diagnosis.—Prior to an attack of inflammation of the middle ear, inflammation of the pharynx, tonsils, or Schneiderian membrane often exists.

Its invasion is, however, at times spontaneous: there is acute pain in the cavity of the tympanum, which is augmented by noise, or by the movement of the lower jaw in mastication, with sensations of beating and almost insupportable dartings. The pain is often referred by the patient to the interior of the cranium, and is compared by him to blows of a hammer; a disagreeable feeling of itching may exist, also, in the throat, where the Eustachian tube terminates; but this symptom is by no means constant. When expiration is made forcibly, with the nose and mouth closed, and the Eustachian tube is pervious, a great increase in the pain is experienced. Frequently, however, the pharyngeal orifice of the tube is not free, when, of course, this test is unavailable.

At a later period, in very severe cases, an abscess may form in the cavity of the tympanum, followed by perforation of the membrana tympani, and a copious discharge of purulent, offensive fluid, by the meatus auditorius externus. If the Eustachian tube be pervious, and a forcible expiration be now made, with the nose and mouth closed, the air will be heard to issue through the perforation in the membrana tympani, and there will be an increase in the discharge of matter. Occasionally, there is found, mixed with the pus,

one of the ossicles of the ear, or carious portions of the mastoid process; but this is more apt to occur in the chronic form of the disease.

It may happen, likewise, that the abscess breaks into the middle ear, and is discharged through the Eustachian tube into the throat. According to one observer, (*Itard*), this occurs in about one case in ten. The patient feels the pus passing down the tube, and rejects it, at times, in considerable quantity. (*Piorry*.)

In very acute cases of otitis of the tympanum, the deafness on the affected side is almost complete, especially when an abscess has formed.

It has been already remarked, that the lining membrane of the cavity of the tympanum is fibro-mucous—or at once a mucous membrane and a periosteum; and it has been shown, that the membrane may be the seat of a blennorrhœal inflammation in its outer layer, and of a more violent inflammation in the inner layer,—the *otitis interna* of many. (*Deleau, Kramer*.) In the former case, the mucus may be secreted in such quantity as to impede the entrance of air through the Eustachian tube into the middle ear, and thus cause deafness. In the latter case, the bony parietes of the tympanum sooner or later participate in the inflammation. Inflammation, too, originally seated in one layer, may spread so as to involve the other.

Where mucus exists in any quantity in the middle ear, it may be detected by catheterism of the Eustachian tube, which has accordingly been employed, not only in the way of diagnosis, but with a therapeutical object. (*Cleland, Deleau, Kramer, Pilcher*.)

Air douches are employed for this purpose by means of an apparatus, which has been described by the author elsewhere. (*New Remedies*, 3d edit. p. 515: Philad. 1841.) Different sounds are rendered, according to the precise condition of the cavity.

Causes.—The condition of the organism that predisposes to external otitis is equally favourable to otitis of the middle ear. Like it, the affection occurs more frequently before than after puberty. It is often a result of affections of the throat, and is occasioned by the inflammation extending along the Eustachian tube by continuity of membrane; but, like other inflammations, it may supervene without any obvious cause.

Treatment.—This ought to be more active than in external otitis. Bleeding may be necessary from the general system; and cupping or leeches will always be needed. At the same time, cathartics and nauseant doses of antimonials should be prescribed. After the active symptoms have been somewhat subdued by this course, revellents—as blisters—should be applied behind the ear, or to the nape of the neck. Should the continuance of the pain, headache, and, perhaps, delirium, indicate that suppuration has taken place, or is about to occur, there is no agency which can expedite it. Generally, the collection will burst through the membrana tympani, but should this not occur before the sixth or seventh day,

it has been thought desirable, that the membrana tympani should be punctured, as the long confinement of matter in the cavity, mixed more or less with air, might, from its being insinuated into the mastoid cells, give rise to caries, or at all events induce a spontaneous laceration of the membrana tympani, that might be highly injurious. (*J. H. Bennett.*) The author has never met with such a case; and he apprehends that the necessity for the measure advised cannot often arise.

After the abscess has made its way through the membrana tympani, warm milk and water, or warm mucilage of sassafras may be injected into the ear, three or four times in the day, and the patient may lie on the affected ear. Should obstruction exist in the Eustachian tube, it may, if at the pharyngeal opening, be removed, at times, by gargles of muriatic acid or of nitrate of potassa; but these will generally be insufficient; and, accordingly, it has been advised to throw into the tube injections of warm water, (*Saissy, Itard,*) or of air, (*Deleau, Kramer.*)

In cases of blennorrhœal otitis of the middle ear, it has been recommended, that the air douche should be employed; and if a slight mucous *râle* is heard, on applying the ear to that of the patient, whilst the air is streaming in, followed by a material improvement in the hearing, which may be ascertained by the distance at which he hears the ticking of a watch, it has been advised that it should be employed daily. Should no improvement, however, in the sense of hearing take place after the fourth sitting, it has been considered that the attempt should not be persisted in. (*Kramer, J. H. Bennett.*)

The careful introduction of the catheter may be very necessary in this variety also.

c. *Acute Inflammation of the Internal Ear.*

SYNON. Otitis interna; *Fr.* Otite labyrinthique.

Inflammation of the internal ear is but little known, and is probably of rare occurrence. When, indeed, it is met with, it would seem to be almost always owing to an extension of inflammatory action from the middle ear or the neighbouring parts. The intensity of the pain, the great depth of the affected parts, the deafness, and the neuralgic character of the disease of the ear, with the sudden supervention of cerebral symptoms, and the absence of the signs of otitis of the external and middle ear, may lead us to suspect its existence. (*Piorry.*)

Treatment.—The general management must be that adapted for inflammation of the ear in general. Little or no good can of course be expected from agents thrown into the middle ear.

d. *Chronic Inflammation of the Ear.*

SYNON. Otitis chronica, Otorrhœa; *Fr.* Otorrhée, Pyo-otorrhée, (*Piorry*); *Ger.* Ohrenfluss.

This form of otitis is much more frequently met with than the

acute. It is, indeed, a common occurrence for persons to be affected through life with it, without suffering any marked inconvenience, except that which is produced by an intermittent or continued discharge from the meatus auditorius externus. Although, however, this may generally be regarded as chronic otitis, it may be kept up like other discharges by a condition of vessels more like that of gleet, in which there is secretory irritation rather than inflammation.

In such cases, the chronic inflammation may be limited to the lining membrane of the middle ear, or it may be complicated with periostitis and caries of the bone. The discharge is extremely fetid; and, at times, fragments of bone are mixed with it. Fœtor of the discharge does not of itself indicate that the bones are affected; for, as in similar conditions of the lining membrane of the nose, the secretion may be peculiarly and disagreeably fetid. At times, the mastoid region becomes implicated owing to the extension of the disease to the mastoid cells, so that ulceration of the bone and soft parts takes place, and a fistulous opening is formed communicating externally. When pain is referred to the mastoid region, along with chronic otitis, the affected mastoid process is sometimes observed to be smaller than the other, owing to its cellular structure becoming broken down, and escaping along with the discharge by the meatus auditorius externus.

In other cases, the otorrhœa is complicated with encephalic disease, giving rise to the *cerebral otorrhœa* of writers. (*Itard, Albert.*) This is one of the dangers to be apprehended from otorrhœa accompanied by caries of the bones: the morbid process is apt to extend to the petrous portion of the temporal bone, whence it readily spreads to the meninges of the brain. By some, it has been supposed, that the encephalic mischief, in such cases, may be primary, and unconnected with the condition of the ear, (*Itard*); but it is probable, that in all cases, it is secondary, although the encephalic mischief may be the first circumstance, that attracts the attention of the patient. (*Lallemand, Piorry, J. H. Bennet.*)

When the encephalon becomes diseased under these circumstances, the character of the affection will be indicated by the functional phenomena pointed out elsewhere; and which need not be repeated here. It is well, however, to bear in mind the fact above mentioned,—that these phenomena may present themselves without any discharge having taken place from the ear; and, consequently, that attention should be paid to discover, whether a complication with otitis may not exist.

Treatment.—When a discharge has existed for any length of time from the meatus auditorius externus, it is important not to suppress it too hastily, as the irritation may be transferred elsewhere, and to parts of greater importance. In all cases, it is essential to attend to the constitutional condition, and if there be evidences of a strumous complication, as there frequently is, the tone of the system must be improved by the remedies elsewhere

recommended for the removal of scrophulosis,—and especially by the use of iodine, as of the iodide of iron, singly or combined with vegetable bitters, along with appropriate diet, change of air, &c.

In regard to the local treatment by injections, difference of sentiment exists. It may be questioned, indeed, whether they can be of much advantage, where the disease affects chiefly the bony portions, and especially the mastoid cells. Injections of warm water, or of warm milk and water, are sufficient, in the first instance, and perhaps they are at all times safest; the facts, indeed, recorded by authors of acute symptoms followed by caries having supervened on the use of a blister, or a seton, or on astringent injections, (*J. H. Bennet*,) ought to induce caution in regard to officious treatment of all kinds. It has been advised, that weak injections of acetate of lead, or of sulphate of zinc, or of any of the ordinary astringents should be continued for months, rather than that we should attempt to arrest the otorrhœa suddenly; gentle counter-irritation may also be established behind the ear, by the ointment of tartarized antimony, or by the croton oil.

Where the discharge proceeds from the middle ear and passes through the membrana tympani it too frequently resists all treatment. In such case, the efforts must be restricted to keeping the ear clean by means of warm emollient injections, wearing a piece of cotton in the ear to absorb the discharge.

Where the otorrhœa is accompanied by caries of bones, the same plan of treatment is advisable; and when encephalic symptoms occur, they must be met by the treatment recommended under Encephalitis.

It would appear, consequently, that in many cases of otorrhœa, great mischief may be induced by officiousness on the part of the physician; whilst, in the majority of cases, his best directed efforts prove rather palliative than curative; and hence we ought to proceed with much caution. “We have laid great stress,” says a very recent writer, (*J. H. Bennet*,) “on the necessity, in chronic otitis, of acting cautiously and slowly, especially when it extends to the tympanum, being convinced, that many of the inveterate cases met with in practice result from the ill-directed and hasty efforts made to effect a speedy cure of the disease by the injudicious use of too astringent injections, and the early employment of blisters, setons, &c.

Where it is not considered advisable to interfere actively with the discharge, the disagreeable fœtor may be very much diminished by appropriate injections of a disinfectant nature—as of weak solutions of the chloride of lime or the chloride of soda.

R.—Calcis chlorid. gr. v.

Mucilag. acaciæ, ℥ij.

Aquæ rosar. ℥ij.—M. et filtra.

R.—Liq. sodæ chlorinat. ℥ss.

Aquæ rosar. ℥ij.—M.

BOOK VIII.

DISEASES OF THE ORGANS OF REPRODUCTION.

MANY of the diseases of the reproductive organs are, by common consent, referred to the domain of external pathology; but there are certain affections, which cannot be passed over in a treatise on internal pathology; some of these will, however, require but a brief notice.

SECTION I.

DISEASES OF THE MALE ORGANS OF REPRODUCTION.

The generative organs of the male—it must be borne in mind—consist of parts which secrete and preserve the sperm,—the fecundating fluid; and of the organ by which copulation is accomplished.

The first consist of two similar glands,—the testes, which secrete the sperm or fecundating fluid from the blood; the excretory ducts of those glands; the vesiculæ seminales, which communicate with the vasa deferentia and the urethra; and the ejaculatory ducts, which convey the sperm from the vesiculæ seminales and vasa deferentia into the canal of the urethra near the neck of the bladder.

During the greater part of gestation, the testis is an abdominal viscus; but, about the seventh month of intra-uterine existence, it gradually descends through the abdominal ring into the scrotum, which it reaches in the eighth month. At times, however, it never descends, but remains in the cavity of the abdomen, giving rise to considerable mental distress, in many instances, under the apprehension that the organ may be wholly wanting, which is rarely the case. (See the author's *Human Physiology*, 4th edit. ii. 331: Philad. 1841.)

The author has seen one or two cases, in which excessive suffering was induced by the testicle presenting at the inner abdominal ring, and becoming compressed and inflamed there. The application of leeches, soothing fomentations, and full doses of opiates,

were, however, sufficient to remove the pain and inflammation. The detention of the testes, in these cases, did not at all interfere with the reproductive powers of the individual.

I. INFLAMMATION OF THE URETHRA.

SYNON. Urethritis, Inflammatio urethræ, Gonorrhœa, Blennorrhœa urethræ, Urethralgia, Medorrhœa virilis, Catarrhus urethræ, Phallorrhœa, Profluvium mucosum urethræ; *Fr.* Uréthrite, Urétrite; *Ger.* Entzündung der Harnröhre.

Inflammation of the urethra, unless caused by mechanical injury, is not common except in the specific form, or in that induced by the application of the matter of impure blennorrhœa. The milder form, or that originating from common causes, has been termed *Gonorrhœa benigna seu simplex*, *Blennorrhœa*, *Blennorrhagia*; the other, *Gonorrhœa venerea*, *G. syphilitica*, *G. virulenta*, *G. maligna*, *G. impura*, *G. contagiosa*; *Fr.* *Chaudepisse*; *Ger.* *Venerische Tripper*.

The former occurs, however, so rarely, and in its general pathology and management resembles so much the latter, that, for convenience, the following description will be directed chiefly to the impure form.

Diagnosis.—The ordinary symptoms of acute gonorrhœa are:—violent pain along the course of the urethra, or in front of the fossa navicularis. The pain differs greatly in character; at times, especially in the first few days, it may be rather a disagreeable feeling of itching than of pain; but, at others, violent shooting pains are felt, which are always greatly aggravated during the passage of the urine, giving rise to *ardor urinæ*, and to the French appellation, *chaudepisse*, as applied to the whole disease.

In the course of two or three days after the impure connection, and along with the above symptoms, a mucous or muco-purulent discharge is observed from the urethra, which is, at first, of a whitish gray colour, and afterwards resembles a greenish or yellowish pus. It always tinges the linen. A grayish discharge, succeeding immediately to the application of an adequate cause, has been esteemed a distinctive character of simple inflammation of the urethra,—the venereal form requiring an incubation of three or four days, (*Andral*;) but it by no means follows, that simple urethritis should succeed so immediately.

In severe cases of venereal inflammation of the urethra, intense pain is experienced during erection, which is so severe, that the penis is drawn down by the frænum, and the patient is often compelled to rise from bed several times in the night under intense suffering. This appears to be owing to the unequal expansion of the corpora cavernosa, and the corpus spongiosum. It constitutes the *gonorrhœa cordata* or *chordee* of writers.

The disease may be accompanied by inflammation of the glans, swelling of the inguinal glands, orchitis and other affections, which demand an appropriate treatment.

When the disease is seated in particular portions rather than in

others, certain symptoms are observed. When, for example, it is restricted to the fossa navicularis, the uneasiness is experienced there, when the patient passes his urine; the glans is always more or less swollen, and the lips of the urethra are tumid and red. On pressing and rolling the urethra between the thumb and forefinger, a distinct thickening is felt, as if a portion of a bougie had been left in the canal, and the pressure gives occasion to much pain: the discharge is generally trifling, and is always presenting at the orifice. When the inflammation is seated chiefly in the part of the urethra between the glans and the bulbous portion, the patient may have no pain in the perinæum, but he experiences great suffering when he passes his urine; has frequent erections of short duration, and the discharge is more copious than when the disease is seated more anteriorly. If, again, the disease be chiefly in the bulbous portion of the urethra, there is pain in the perinæum, increased by pressure, a constant desire to void the urine, and frequent erections: the discharge is copious, and the size of the stream of urine diminished. When the membranous portion is chiefly affected, the pain is severe in the neighbourhood of the anus, and the desire to pass the urine is, at times, constant; the prostate and testicles may be enlarged and painful; and, it need scarcely be said, there is greater fear of the inflammation extending to those organs and to the bladder. (*L. Parker.*)

The duration of acute inflammation of the urethra varies. It may terminate in a week, or not for several weeks. Its average duration has been estimated at about 25 days. (*Andral.*)

Occasionally, the disease becomes chronic, and may end in a simple blennorrhœa—*b. chronica*, *gonorrhœa mucosa*, or *gleet*, which does not stain the linen, and is devoid of all infectious properties.

Causes.—The causes of urethritis may be various. Simple urethritis has been assigned to venereal excesses between entirely healthy individuals, as well as to masturbation. (*Andral.*) It certainly may be induced by external injury; and it is said, to have been brought on by pressure on the perineal region during riding. It is not unfrequently, however, ascribed to this cause, when it has been contracted by impure connection. It is caused, also, at times, by stricture of the urethra, and by the presence of a calculus in the passage. The introduction of a bougie, and the employment of stimulating injections has likewise given occasion to it. In experiments, instituted with the view of noticing the effects that would be induced by the injection of stimulating substances into the urethra, phenomena have resulted, which could not be distinguished from those following impure sexual intercourse.

The most frequent cause of urethritis is doubtless such impure intercourse.

Treatment.—Simple acute urethritis requires the usual antiphlogistic treatment. Should the inflammation be intense, it may be necessary to draw blood from the arm; to apply leeches to the

perinæum, and, after they fall off, warm cataplasms or fomentations. Diluents may be freely allowed; they render the urine less irritating to the parts over which it passes. Demulcents—as flaxseed tea, mucilage of gum arabic, &c.—are usually prescribed, but they probably act as simple diluents; the mucilage being digested, and the watery portions alone being separated by the kidneys. Active cathartics are doubtful remedies. If they operate violently, the irritation excited by them is apt to be extended to the urethra by contiguous sympathy, and portions of those of the saline kind may be taken up into the mass of blood and be separated by the kidneys—thus rendering the urine more irritating. Castor oil is the best cathartic that could be administered. Rest of body is, of course, all important.

In cases of specific or impure gonorrhœa, the treatment will have to vary, according to the intensity of the symptoms. If the disease be acute, it may require a similar antiphlogistic treatment to that of acute simple urethritis. No better treatment can, indeed, be pursued in the first stage of almost all cases, whenever there are signs of inflammation in any part of the canal. After, however, the active symptoms have passed away, another course, which has been termed, of late, “the revellent,” becomes advisable. It consists in the administration of substances, which, either by their operation on the kidneys, or on the diseased mucous membrane itself, induce a new action in it.

Difficulty at times exists in deciding as to the precise period at which the antiphlogistic measures should be discontinued, and revellents be prescribed, and this will of course have to be determined by the judgment of the practitioner. “When”—says a recent observer, (*Ricord*)—“the acute stage has ceased, although the patient may still continue to be troubled with erections, the penis be heavy and uneasy, and the lips of the meatus red and slightly swollen, I have recourse to those remedies, which are termed, *par excellence*, antigonorrhœal, which I abandon, however, to have recourse, again, to antiphlogistics, should their employment occasion the least increase of inflammation.”

Of the revellent antigonorrhœal remedies, one of the most commonly employed is the copaiba. It has long been the custom to prescribe it in association with other substances, as in the following formula:—

R.—Copaib.

Sp. æther. nitric. āā ʒss.

Pulv. gum. acaciæ

—— sacchar. alb. āā ʒj.

Sp. lavand. comp. ʒij.

Tinct. opii, ʒj.

Aquæ destillat. ʒiv.—M.

Dose, a tablespoonful, three times a day.

Or, in the following formula:—(*Wallace.*)

R.—Copaib.
 Pulv. cubeb. āā ʒj.
 Liq. potass. ʒij.
 Pulv. acaciæ, ʒss.
 Aquæ rosæ, ʒvj.—M.

But many of the recent writers (*Ricord, Desruelles*,) prefer to give it alone. It may be taken in wine or lemonade, or be dropped in a wine-glassful of water, to which a small quantity of the compound tincture of gentian has been added. Many practitioners are in the habit of giving it in the dose of a drachm or more three times a day, from the very commencement of the disease; and, with the view of cutting it short at the very onset, it has been proposed to administer as much as from two drachms to an ounce for a dose, (*Ribes*;) but, although this treatment may prove successful at times, it has been found to augment the inflammatory symptoms and the discharge. Its efficacy is more exhibited, when given after an appropriate antiphlogistic treatment. (*Lallemand*.) To avoid the disagreeable taste of the copaiba, it has been administered in the gelatinous capsules: the essential oil of the copaiba and the resin have likewise been given, but they have not been considered equal to the copaiba, as recommended above. (*L. Parker*.) It has been administered, also, in the form of enema. (*Velpeau*.)

The cubebs have likewise been given under the same circumstances as the copaiba. They are commonly prescribed in the form of powder, and in doses of one, two, and even four drachms, repeated once or oftener in the day. Lozenges, boluses, and electuaries, have likewise been prepared of them, and the London and Dublin Pharmacopœias have a tincture of cubebs.

R.—Cubeb. ʒiv.
 Spiritus tenuior. Oij.—M.—Dose, f. ʒj.—ʒij.

In consequence of the disorder sometimes produced by them, it has been proposed, that they should be given in the form of glyster, to the amount of one or two drachms of the powder, suspended in five or six ounces of an oleaginous mixture. (*Velpeau*.) To attain the same object, an oleo-resinous extract has been prepared, one sixteenth part of which, by weight, possesses equal virtues with one part of the cubebs,—five grains three times a day acting like the ordinary quantity of the powdered cubebs. The volatile oil is sometimes given in the dose of ten or twelve drops, suspended in water by the aid of sugar. (See the author's *New Remedies*, 3d edit. p. 192: Philada. 1841.)

By some, creasote has been prescribed internally in the chronic stage of gonorrhœa and in gleet; and a recent writer (*Dick*) thinks its beneficial effects more obvious than those of copaiba. He administered it in doses of two drops with loaf sugar beaten into a syrup with water.

Injections are employed in gonorrhœa with two objects;—*first*, to cut short the disease, before the acute stage has commenced; and, *secondly*, to arrest it, after the acute stage has been appro-

priately treated by antiphlogistics. With the first view, the nitrate of silver may be used.

R.—Argent. nitrat. gr. ij.
Aquæ destillat. ℥viij.—M.

The strength to be gradually increased so long as no irritation is induced.

After the acute stage has passed away, the same solution may be employed, or solutions of the acetate of lead,¹ corrosive chloride of mercury,² acetate of zinc,³ sulphate of copper,³ or chloride of zinc.⁴

¹ R.—Plumb. acetat. ℥ij—℥j. ² R.—Hydrarg. chlorid. corrosiv. gr. iv.
Aquæ destillat. ℥viij.—M. Aquæ destillat. ℥viij.—M.

³ R.—Zinci acet. gr. x—xx. ³ R.—Cupri sulphat. gr. x—xv.
Aquæ destillat. ℥viij.—M. Aquæ destillat. ℥viij.—M.

⁴ R.—Zinci chlorid. gr. viij.
Aquæ destillat. ℥viij.—M.

When all inflammatory signs have subsided, and the disease is altogether atonic, injections of wine have been advised with or without tannin. (*Ricord, Desruelles.*)

R.—Vin. rubr. ℥ij.
Aquæ rosæ, ℥iv.—M.

The quantity of wine to be gradually increased until it is used pure.

R.—Tannin. gr. xvij.
Vin. rubr. ℥vj.—M.

The iodide of iron has likewise been employed with much success. (*Ricord.*)

R.—Ferri iodid. gr. iij.
Aquæ destillat. ℥vj.—M.

Creasote water has been much used under the like circumstances, both in the way of injection, and by small tents wetted with it, and introduced into the urethra. (*Most.*)

It is frequently advantageous to vary the injection, as some patients bear one kind better than another: persons are found to be much benefited by port wine and tannin, who could not bear the weakest solution of the nitrate of silver. (*L. Parker.*)

The aqua chlorini has, likewise, been used as an injection, either pure or diluted. (*Eisenmann, Cullerier, Blache.*)

A distinguished German surgeon, (*Gräfe,*) frequently succeeded with the chloride of lime, after copaiba and cubebs had failed. He used it both in the form of pill,¹ and of injection.²

¹ R.—Calcis chlorid. ℥j.
Extract opii, gr. ix.
Mucilag. gum acac. q. s. ut fiant pilul. liv.

Dose, one, every two or three hours, gradually increasing until eight, ten, or twelve are taken every hour.

² R.—Calcis chlorid. gr. xxiv.
Aquæ, ℥vj.
Vin. opii. ℥ss.—M.

It has been the opinion of many observers, that gonorrhœa is commonly kept up from the contact of the two sides of the urethra,

accordingly, it was proposed to introduce, by means of an elastic gum catheter or bougie, a fine piece of lint into the urethra, and let it remain there, removing it only at each period of making water,—the lint being employed dry, or soaked in any astringent injection. The practice is said to have been followed by great success; (*Fricke, Ricord, Desruelles*;) perhaps, however, in consequence of the new action excited by it in the parts, with which the lint was made to come in contact.

At times, the discharge continues in spite of the best directed efforts; in some of these cases, however, the use of an ordinary bougie is attended with excellent results; and, in others, the application of the solid nitrate of silver, passed through an appropriate canula, is highly beneficial. Cases occur, however, in which the individual is compelled to submit to the inconvenience of more or less discharge for years, and, at times, it happens, that after a gleet has continued for a long period, it ceases spontaneously.

II. INFLAMMATION OF THE TESTICLES.

SYNON. Inflammatio testiculi, Orchitis, Didymitis, Swelled testicle; *Fr.* Orchite, Hernie humorale, Inflammation du testicule; *Ger.* Entzündung des Hoden, Entzündliche Hodengeschwulst, Hodenentzündung.

Not unfrequently we have accompanying, or succeeding gonorrhœa, an affection of the testicle or rather of the epididymis, commonly known under the names *Hernia humoralis*, *H. venerea*, and *Swelled testicle*. The affection would seem to be inflammation of the epididymis,—*Epididymitis*, *Epididymite blennorrhagique*, (*Ricord*;) and the dissections of M. Ricord show, that it is generally confined to the convolutions of the epididymis. It commonly occurs about the third week, and appears to be owing, at times, to sympathetic irritation; and, at others, to extension of the disease from the urethra along the vas deferens.

The *treatment* consists in the employment of antiphlogistics—as general and local blood-letting, the use of a suspensory bandage, and confinement to the horizontal posture. Warm fomentations and poultices afford great relief; and, when the acute symptoms have subsided, great benefit is said to have accrued from strapping the scrotum, so as to exert methodical pressure on the testicle. (*Fricke, Cullerier, Ricord*.)

When the active inflammatory symptoms have passed away, the revellent remedies, which were previously improper, may be resumed to remove the gonorrhœa, and should any thickening of the epididymis remain, the patient may be put upon a mild mercurial course, continued so as to affect the mouth gently. (*Ricord*.)

Inflammation of the testicle may likewise be induced by common causes, or by mechanical injury; but the treatment recommended above requires no modification. Of course, where no gonorrhœa exists, no antigonorrhœal remedies can be necessary.

III. INFLAMMATION OF THE PROSTATE.

SYNON. Inflammatio prostatæ, Prostatitis; *Fr.* Prostatite, Inflammation de la Prostate; *Ger.* Entzündung der Vorsteherdrüse, Vorsteherdrüsenentzündung.

Affections of the prostate gland, which are very common in old age—like most diseases of the urinary organs—are considered to fall in the domain of surgery.

Diagnosis.—Acute inflammation of the prostate is often an accompaniment of gonorrhœa, and is indicated by a sense of unusual weight and heat at the neck of the bladder; by pulsating pain, at times, increased on pressure, especially on examination by the rectum; pain in defecation, with a feeling as if the bowel had been imperfectly evacuated; frequent and urgent desire to void the urine, with great difficulty in so doing, and sometimes complete retention. Along with these symptoms, there is generally more or less constitutional disturbance. The affection usually passes off by resolution, but abscesses may form in and around the prostate, and give rise to a most distressing condition. When the urine gets access to these suppurations, the patient may be destroyed by fever and irritation, and incessant calls to discharge the urine. (*Sir Charles Bell.*)

Causes.—It has been remarked, that the prostate is sometimes inflamed as a consequence of gonorrhœa. It may, also, be produced by inflammation primarily seated in the kidneys or bladder; and may itself be the cause of inflammation of those organs. It is affirmed to have been induced by metastasis of gout. (*Most.*)

Treatment.—The treatment of prostatitis is similar to that required for cystitis;—general and local blood-letting, fomentations applied to the perinæum, and thrown into the rectum; with full doses of opiates to allay irritation. Should it be necessary to introduce the catheter when suppuration has taken place, care must be taken not to entangle the point in any small abscesses, and not to force the instrument between the bladder and the rectum. A large catheter is, for these reasons, preferable to a smaller.

In advanced life, the prostate is liable to become *chronically* enlarged. The affection generally commences obscurely, and the gland attains some size before it is detected. The symptoms are a sense of weight low down in the pelvis, with difficulty in voiding the urine, and, at times, entire obstruction. When the finger is passed into the rectum, the enlargement can be distinctly felt.

In these cases, it is often necessary to introduce the catheter twice a day or oftener, with the view of drawing off the urine. More frequently, however, there is a constant stillicidium, which is even more distressing. Where the enlargement of the prostate occurs in old age, internal medicine has but little effect upon it. Usually, the patient is put upon a gentle mercurial associated with the extract of conium.

R.—Hydrargyri chlorid. mit. gr. x.

Ext. conii. ʒss.—M. et divide in pil. xij.

Dose, one, night and morning.

The bowels should be kept open by the gentlest laxatives, as castor oil, or by warm emollient enemata. Leeches may be required from time to time, should there be evidences of inflammatory irritation.

IV. SPERMATORRHŒA.

SYNON. Paroniria salax, Gonorrhœa oneirogonos, G. dormientium, Exoneirosis; *Fr.* Spermatorrhée, Pollution involontaire; *Ger.* Samenfluss.

The term Spermatorrhœa was, at one time, used by many for an involuntary discharge of sperm without erection; but it has been employed, likewise, in a more extended signification,—to include too great a flow of sperm, whether produced by masturbation, or occurring during the night whilst the individual is asleep. (*Lallemand.*) These cases are extremely common: the author is annually consulted by persons suffering under the effects—as they conceive—of inordinate discharge of sperm, either from vicious habits, or in dreaming. That excessive secretion may act injuriously upon the nervous system, there can be little doubt; but the injurious physical consequences, that have been ascribed to it, have often been wholly fabulous. Speaking of it in a medical point of view, there can be no greater evil to the economy from a flow of semen accompanied by venereal desire, without sexual intercourse, than with it; yet where vicious habits have been contracted, alarm is often excited by the perusal of cases of serious disease, ascribed to similar practices; and the individual becomes nervous and apprehensive, until ultimately his life is rendered miserable to him. He observes, in the advertisements of the empiric, the numerous mental and bodily evils that may be his lot; and it has happened, that he has not had courage enough to support his fancied afflictions, and has been led to commit suicide. This has more especially occurred if the person has been engaged in marriage, and has been impressed with the idea, that impotence must necessarily result.

It is proper to state, that of the many cases in which the author has been consulted by young men thus circumstanced, and who have married subsequently, in no case has he heard of any impediment to procreation existing subsequently; and, consequently, unless the spermatorrhœa occurs in the day-time, and without venereal desire; or, unless, along with such desire, it takes place immediately on the erection of the male organ, he has advised the fulfilment of the patient's matrimonial intentions, and has never heard a complaint afterwards.

Spermatorrhœa, in the form of "nocturnal pollution," is common; and unless it occurs more than once in the course of the night, and every night, it ought scarcely to be esteemed a pathological condition. The presence of sperm in the seminal ducts or vesicles produces an excitement during sleep, which is appreciated by the brain, salacious dreams are the consequence, during which the seminal emission occurs.

These forms of spermatorrhœa cannot be mistaken. The patient

either induces them by his own acts, or has full evidence of them from his sensations during sleep, and the appearances on awaking.

Another form of spermatorrhœa, however, is not so clear. In this, there is a discharge of a glairy, viscid fluid, whilst the last drops of urine are discharged, or on straining during the evacuation of the bowels. (*Lallemand*.) But the presence of such a fluid in those circumstances by no means shows that it is sperm. Indeed, it probably rarely is so, and is nothing more than the mucous fluid from the prostate or the glands of Cowper. It has been proposed to employ the microscope in our doubt; and that if proper animalcules be found in the fluid, we may pronounce the secretion to be seminal; but this would not be decisive, inasmuch as those animalcules have been found in the mucous secretions of the urethra, and even in the urine. Moreover, M. Lallemand believes, that the seminal animalcules are deficient in these very cases, which ought certainly to be unfavourable to the idea, that the fluid proceeds from the spermatic vessels.

In most of the instances, that have fallen under the care of the author, he has been satisfied, that the glairy fluid was mucous and not seminal.

The general effects ascribed to spermatorrhœa are various: the functions of the alimentary canal are said to become gradually impaired, and to be irregularly accomplished; but the animal functions suffer chiefly; the mind especially feels the effects; and the individual becomes hypochondriacal, misanthropic, and may even fall into a state of dementia.

In another part of this volume, the author has inquired into the effect of spermatorrhœa in the causation of insanity, and has given ample reason to believe, that it has been exaggerated. The writer, already cited, (*Lallemand*, translated by *W. Wood*, of Maine,) has had an opportunity for examining the bodies of patients, who had died, he conceived, of exhaustion caused by involuntary discharges of sperm, or had perished from some accidental affection during the continuance of such discharges. He found the orifices of the ejaculatory ducts dilated, the seminal vessels hardened, and contracted, and the prostate generally diseased. In several subjects, the gland was filled with a multitude of small abscesses, and its whole tissue was pale and soft. The urethra was rarely free from disease; it was thickened, and a firm and extensive stricture was found in several patients; the bladder and kidneys, too, participated in the morbid condition.

Causes.—These are—gonorrhœa, which is very liable to leave behind it the lesions mentioned above; excessive sexual indulgence, or masturbation; affections of the rectum, that oppose a mechanical obstacle to the passage of the fæces, and occasion pressure on the vesiculæ seminales, and the prostate,—or, a fissure of the rectum or hemorrhoids, by occasioning violent straining, may produce the same effect. Ascarides in the rectum would seem to have caused

so much irritation as to react upon the urethra and vesiculæ seminales, and to give rise to profuse involuntary discharges of sperm. A case is given (*Lallemand*) of obstinate spermatorrhœa occurring chiefly during sleep, which resisted all methods of treatment until the ascarides were removed by large and repeated enemata of very cold water. It is not improbable, however, that the impression made indirectly by the cold on the parts implicated may have been salutary.

Treatment.—It need scarcely be said, that in all cases of spermatorrhœa, the treatment will have to be moral as well as physical. If the disease be kept up by vicious habits, these must be abandoned; and the mental effects resulting directly or indirectly must be modified by a change of all the influences surrounding the individual, like that advised under Hypochondriasis; attending, at the same time, to the physical aberrations that may present themselves. Of course, if the spermatorrhœa be owing to, or connected with, disease of the rectum, obstinate constipation, irritation from worms or any other appreciable cause, it will yield on the removal of these conditions; but if it be dependent upon an altered state of the urethra, ejaculatory ducts and prostate—as described above—it may not give way to any remedy except direct cauterization. This may be practised by passing the solid nitrate of silver into the urethra, enclosed in an appropriate canula, and turning it very rapidly over the part to be cauterized, retaining it in contact with the part as short a time as possible, and then rapidly withdrawing it. (*Wood's Lallemand.*)

After the application of the caustic, the discharge of urine is excessively painful for a day or two, and is sometimes a little tinged with blood; but after the pain has ceased, the spermatorrhœa is often suspended, and the whole of the local and general symptoms gradually pass away. (*Lallemand.*)

For the nervousness, or great impressibility often seen in these cases, the physician is sometimes called upon to prescribe; and he is led to combine tonics with astringents. Thus, the *tinctura ferri muriatis*, (gtt. x, ter die,) and the *liquor ferri iodidi*, (gtt. xv, ter die,) are not unfrequently prescribed; and they are as likely to prove serviceable as any therapeutical agent; but the author has not derived any advantage from them.

Where the mental distress is considerable,—especially under the circumstances before mentioned, where a matrimonial alliance is projected, and the individual is afraid he may prove impotent,—provided he is capable of erection, it may be proper to advise, that the alliance should be entered into; and although moral impotence may exist for a short time, it will gradually wear off. As before remarked, the author has never heard any complaint subsequently, where this course has been pursued; and he has recommended it in many instances.

SECTION II.

DISEASES OF THE FEMALE ORGANS OF REPRODUCTION.

The organs, concerned in the diseases to be considered here, are the vagina, uterus and ovaries; the two first lined by the same mucous membrane, and, therefore, liable to be simultaneously affected when inflammation attacks one of them. It must be recollected, too, that the urethra opens into the former, and that it also is lined by a mucous membrane, which is continuous, on the one hand with that of the bladder, and on the other with that of the vagina.

The ovaries are seated in the peritoneal expansions forming the broad ligaments, and have no direct communication with the interior of the uterus.

I. DISEASES OF THE VAGINA.

a. INFLAMMATION OF THE VAGINA.

SYN. Inflammatio vaginæ, Vaginitis, Colpitis, Elytritis, Elytroneus inflammatorius; *Fr.* Vaginite, Inflammation du Vagin; *Ger.* Entzündung der Scheide, Scheidenentzündung.

Inflammation of the vagina is of common occurrence. It may be caused by mechanical injuries, or by the circumstances that give rise to inflammatory affections in other mucous membranes, and be of transient duration; or it may be more chronic in its character, and be a true blennorrhœa or catarrh of the mucous membrane; or it may be induced by the application of specific matter;—for gonorrhœa in the female is mainly seated in this membrane. Hence, inflammation of the vagina may be considered under three heads,—first, the *acute*; second, the *chronic*; and third, the *specific* form.

1. *Acute Inflammation of the Vagina.*

SYN. Acute vaginitis.

Diagnosis.—The symptoms of this affection are—great heat, pain and dryness of the membrane, with generally more or less inflammation of the neighbouring parts, nymphæ, clitoris, labia, &c. The membrane becomes greatly tumefied, and there is a sensation of tightness in the vagina, with pain in the back, lower part of the abdomen, and down the thighs. As in other cases of inflammation of mucous membranes, in the course of a day or two, augmented secretion takes place, which may be watery at first, but is afterwards purulent or muco-purulent. As soon as the discharge is established, the local uneasiness is relieved; and if the constitutional symptoms have been severe, they become mitigated.

The inflammation may end by resolution or pass into the chronic form.

Causes.—The most common causes are those of ordinary in-

flammation,—mechanical injuries—as during delivery or from excessive coition—the injection of stimulating substances, &c.

Treatment.—Should the extent of the inflammation demand it, blood may be taken from the general system, and leeches be applied to the vulva; followed by warm fomentations, and the injection of warm water or emollient fluids into the vagina. Relief is, also, afforded by sitting over the vapour of hot water. It need hardly be said, that the horizontal posture should be maintained; and the diet be spare and easy of digestion.

2. *Chronic Inflammation of the Vagina.*

SYNON. Chronic vaginitis, Blennorrhœa vaginæ, Leucorrhœa, Medorrhœa vaginæ, Elytroblennorrhœa, Vaginal leucorrhœa, Fluor albus, Whites, Sexual weakness; *Fr.* Fleurs blanches, Pertes blanches, Ecoulement blanc; *Ger.* Leukorrhœe, Weisse Fluss.

This common affection of females, from which few—if any—escape altogether, may occur at any time of life, but it is most common between the first commencement and the termination of the menstrual secretion. In young children, a blennorrhœa is sometimes seen, which, where a charge of rape has been laid, might be looked upon as the result of impure connection; but it arises at times from want of cleanliness in unhealthy children, combined, or not, with intestinal irritation. Occasionally, *ascarides* escape from the rectum, enter the vagina, and by lodging there may induce it. A recent writer (*Professor Meigs*, of Philadelphia) states, that he has seen very obstinate examples of leucorrhœa in children of two years old; and that many persons are afflicted with it at from fifty to eighty years of age.

Diagnosis.—The only symptom that gives occasion to inconvenience may be a discharge from the vagina, which, in mild cases, is whitish; but, at others, is of a brownish colour, and sufficiently acrid to excoriate the labia. When the discharge is very profuse, sympathetic phenomena are induced,—such as a sensation of debility especially on exertion; uneasiness in the back, and, if it continues, the irritation is apt to be reflected in various directions, so that the functions of the digestive and other organs become impaired, and hysteria, in some form, is a common complication.

When the discharge takes place from the uterus, it is said to occur more intermittently, and to be accompanied by clots of blood and mucus; or by pain in the uterus. (*C. A. Tott.*) It, moreover, augments before and after each menstrual period; and, is accompanied by more constitutional suffering. (*Churchill.*)

A moderate discharge is compatible with vigorous health; and it has even been considered, in many instances, as an indication of the general vigour and activity of the organs of generation. (*Simpson.*)

Causes.—It is not easy to discover these in all cases. The following have been enumerated;—rapid succession of children,

masturbation, excessive coition, mechanical injuries by pessaries, ascarides, acrid discharges from the uterus, prolapsus, polypi, and sympathetic irritations—which are necessarily obscure—from other parts of the economy.

Treatment.—Although the disease may be a true state of chronic inflammation of the vagina, there can be no doubt that it is often, likewise, a mere gleet, like that which occurs from other mucous membranes. There is secretory irritation, but not inflammation. This causes, however, but little difference in the management. The physician can readily discriminate the cases that are inflammatory from those that are not, and adapt his measures accordingly. In all cases, too, it is important, that he should endeavour to discover the causes and the pathological conditions that may be connected with the disease, and remove them if practicable; hence it is advisable, in all obstinate cases, to make an examination *per vaginam*. “I have seen,” says a recent writer, (*Professor Meigs*, of Philadelphia,) “a supposed case of bad leucorrhœa, in which the patient, although long under medical care, had never been ‘touched’ until I was called to see her, and I immediately learned, that the entire cervix uteri had disappeared under the destructive progress of a corroding ulcer. I found, on one occasion, an old cork pessary entirely deprived of its coating of wax, which was causing a most distressing leucorrhœa, that ceased upon the removal of the foreign body. A polypus, by its presence and pressure, can hardly fail to occasion a degree of mucous irritation, which cannot be expected to cease until after the removal of the polypus. A prolapsed state of the womb is very often met with in leucorrhœa, and may be justly suspected of maintaining an unnatural irritation of the mucous textures, as well as of every other part of the genital apparatus. The removal of such a prolapsion by the appropriate remedies, permits the leucorrhœa to cease.”

It is not often necessary to take blood, but advantage may occasionally arise from the mixed depletory and revellent action of cupping the loins, or of leeches applied to the interior of the thighs or the lower part of the abdomen.

The general treatment must vary according to the individual case. If there be great irritation, the horizontal posture should be maintained, as much as possible; and yet, in protracted cases, the benefit derived from air, especially from travelling air and exercise, is so great, that it has to be to a certain extent, pretermitted. Generally, the condition of the system is such as to indicate the employment of chalybeates; and, therefore, where the circumstances of the patient will admit of it, a visit to chalybeate springs, where, along with the use of the waters, she may have all the advantages which a thorough mutation of all the influences surrounding her is capable of effecting, should be recommended. Where this is impracticable, one of the best preparations of iron is the

iodide. (*Liq. ferri iodid.* gtt. x. ter die.) The tincture of muriate of iron, (gtt. viij. ter die,) may also be prescribed.

Various therapeutical agents have been advised internally, but their powers are limited; and their main effect is probably exerted on the general system. It is difficult for us to conceive how cubeb, copaiba, cantharides, turpentine, alum, uva ursi, &c. can "act on the utero-vaginal membrane," (*Simpson*), in any other manner; and that if such be their mode of operation, how it can be very effective. Accordingly they are but little used.

Proper attention being paid to the constitutional condition, the local affection must be treated by appropriate remedies, on which the main reliance is usually placed. When the disease is slight, it may yield to cold water, thrown into the vagina several times a day, and to rigid attention to cleanliness. The agents that have been found of the greatest service, have been those of the astringent or excitant classes, as decoctions of oak bark, alone or with alum,¹ solutions of alum,² sulphate of zinc,³ nitrate of silver,⁴ aqua chlorini—pure or diluted, creasote water, lime water, &c.

¹ R.—Quercûs cort. ʒss.
Aquæ, Oiss.
Coque ad Oj. et cola; tum

Adde,
Alumin. ʒss.—M.

² R.—Alumin. ʒj.—ij.
Aquæ, Oss.—M.

³ R.—Zinci sulphat. ʒij.—ʒiij.
Aquæ, Oss.—M.

⁴ R.—Argent. nitrat. gr. xx.—xl.
Aquæ destillat. Oss.—M.

The injections may be used twice a day, gradually increasing the strength, unless tenderness, or sense of weight in the pelvis should supervene, when they ought to be discontinued, or be greatly reduced in strength.

Should there be great sensibility of the vagina and uterus—anodyne injections of starch and laudanum, or of the decoction of poppyheads, may be employed, and as soon as the supersensitiveness disappears, the astringent injections may be substituted.

An experienced and accurate observer, (*Professor Huston*, of Philadelphia,) informs the author, that he has seen more advantage from injections of the oil of turpentine than from any other.

R.—Ol. tereb. ʒj.
Mucilag. acaciæ,
Aquæ, aa ʒiss.—M.

At times, benefit is derived from the application of the solid nitrate of silver to the vagina, (*Jewel*), as well as from a cylindrical pessary, which acts like the bougie in the blennorrhœa of the male sex, by inducing a new action in the secretory apparatus of the mucous membrane. By analogy, the bougie has been advised by one practitioner, (*Sharpless*, of Philadelphia.)

When injections are used, they may be thrown into the vagina through the ordinary female syringe; or, in married females, a cylindrical pessary, made of sponge, may be dipped in the liquid,

be inserted into the vagina, and retained there, or be withdrawn according to circumstances. (*Simpson*.)

In addition to injections, the cold douche to the loins, or shower bath, has been found useful.

When the leucorrhœa has ceased, it will be advisable to continue the use of the injections for some time, as relaxation of the lining membrane of the vagina is apt to follow, which may lead to ædoptosis or prolapsus. To prevent a recurrence, it is also well to use the bidet once or twice a day.

3. *Specific Inflammation of the Vagina.*

SYNON. Gonorrhœa of the female.

Gonorrhœa in the male is a specific inflammation of the lining membrane of the urethra. In the female, it involves chiefly the vagina and vulva; and, less considerably, the urethra and uterus.

It is indicated by the ordinary signs of inflammation of the vagina, but the irritation is usually greater in this variety; the discharge is yellowish or greenish, and there is great ardor urinæ, and discharge from the urethra.

It must be admitted, however, that it is not easy to distinguish the inflammation arising from impure connection, from that which originates in simple causes. One writer of distinction (*Sir Charles M. Clarke*) thinks it impossible. The speculum may aid us in the diagnosis. Whenever the peculiar erosions or superficial ulcers of the mucous membrane covering the cervix uteri, which were seen by a recent observer (*Ricord*) in 19 out of 20 cases, are found, there ought to be little hesitation, perhaps, in pronouncing the disease to be gonorrhœa, (*Churchill*;) yet this diagnosis can scarcely be considered certain; and, after all, much will depend upon the moral character of the female.

An interesting question arises—as to whether leucorrhœa can communicate a similar discharge to the male. The author has met with one or two cases, in which a discharge in the husband was so attributed, and where the character of the parties was above suspicion; and similar instances have occurred to others. (*Churchill*.) A recent writer (*L. Parker*) has seen severe inflammation of the glans and prepuce, with ulcerations, occur after intercourse with females labouring under leucorrhœa; but a true urethral blennorrhœa—he thinks—has never, perhaps, been so induced.

Treatment.—In the early stages of gonorrhœa, the treatment must be that recommended for acute inflammation of the vagina. The first object is—to reduce the activity of the inflammation. After this has been done, the treatment has to be rather local than general,—the antigonorrheal remedies, so much used when the disease affects the male,—copaiba, cubebs, &c., being of but little efficacy. Aperients, with diluent drinks, constitute almost the whole of the internal treatment.

The local treatment consists in leeching the vulva; the use of warm fomentations; emollient and anodyne injections, and the entire soothing plan. As in the case of the male, it has been presumed (*Fricke, Ricord*) that gonorrhœa may be kept up by the contact of the two sides of the inflamed mucous membrane; and hence it has been advised, that a soft plug of charpie or lint should be introduced into the vagina, which may be changed twice a day, and, during the intervals, be kept moist by injections, adapted to the nature of the case, thrown over it by means of a syringe. The plug may, also, be dipped in the injection before it is introduced.

The time soon arrives, however, when topical applications of another kind become advisable;—the patient still suffering from pain and a copious discharge, and the membrane being in a state of hyperæmia. Under such circumstances, it has been advised of late years, to pass the solid nitrate of silver over the parts, (*Hannay, Jewell*), or to use it in the form of an injection, plugging the vagina in the intervals with a piece of soft dry lint.

R.—Argent. nitrat. gr. x—xv.
Aquæ destillat. ℥j.—M.

Other injections may likewise be used—as the acetate of lead, and the sulphate of alumina, with the view of preventing the disease from becoming chronic.

R.—Plumb. acetat. ℥ij—℥ij.
Aquæ, Oij.—M.

R.—Alumin. ℥ij—℥ij.
Aquæ, Oij.—M.

In the chronic forms of the disease, it is advisable to employ the speculum to examine into the condition of the affected mucous membrane. In some cases, it may exhibit nothing more than evidences of inflammation, without any material change of structure; but in others, vesicles, pustules or ulcers may be seen here and there; and, in long protracted cases, the os uteri is said to be always more or less implicated,—the lips being turgid, red, and everted, and generally covered with small ulcerations, granulations, or other changes resulting from chronic inflammation. (*Ricord, L. Parker*.)

Where the discharge is chronic without change of structure, the solutions already advised in chronic leucorrhœa, or those of tannin¹, may be prescribed.

¹ R.—Tannin. ℥ij—℥j.
Vini. rubr. ℥vj.—M.

When the discharge is very offensive, solutions of chloride of lime or chloride of soda may be substituted.

Where ulcerations or granulations exist, it may be well to touch them through the speculum with the solid nitrate of silver, or to throw in an injection of the nitrate, of the strength of six grains to the ounce of water. The same injection is adapted for cases, which have extended into the uterus along its lining membrane. (*Ricord*.)

II. DISEASES OF THE UTERUS.

a. ORGANIC DISEASES OF THE UTERUS.

1. *Hyperæmia of the Uterus.*

SYNON. Congestion of the uterus; *Fr.* Congestion sanguine de l'utérus, Métrohémié ou Hypermétrohémié. (*Piorry.*)

This condition occurs frequently about the first establishment of the catamenia, and always exists to a greater or less degree at each menstrual period; for, whether the discharge be regarded as a secretion from the uterine vessels or as a periodical hemorrhage, a greater flow of blood will necessarily take place to the uterus, and occasion hyperæmia of the capillary vessels. Hyperæmia likewise appears about the period of the cessation of the menses, and before they are finally arrested,—the female often experiencing uneasy sensations and signs of fulness in the uterine region, and not unfrequently copious hemorrhage.

It need scarcely be said, that the hyperæmia, which precedes or accompanies each menstrual period, is a physiological or healthy state, and that it only becomes pathological, when it passes beyond the proper bounds, or occurs at periods when it is not demanded by the healthy function.

Diagnosis.—The usual symptoms are—a feeling of fulness, tenseness or heaviness in the pelvis, which may be referred to various parts of the bony parietes. The pain, which is seated deep in the pelvis, appears in paroxysms, and is, at times, very severe, so as to have received the name *uterine colic, cramp, or tenesmus.* (*Andral.*)

The pain is not augmented on pressure, and the affection is rarely accompanied by constitutional disturbance. At times, however, the stomach sympathizes, and, occasionally, there is tenderness of the mammæ when they are pressed upon. Often, too, hysterical symptoms exist.

Where the hyperæmia has persisted for some time, the uterus, when an examination is made *per vaginam*, is generally found to be enlarged, and low down in the cavity of the pelvis; the os uteri is patulous, and its lips are tumid and spongy, but they are little, if at all, tender upon pressure; nor is there the increased heat of the parts observed in cases of inflammation. The use of the speculum shows a discoloured and purplish state of the surface of the cervix and os uteri, and especially of the lining membrane of the latter, with, occasionally, an exudation of blood upon it. (*Simpson.*)

Causes.—Organic diseases of the uterus, as polypus, may predispose to this affection, especially at the menstrual periods. Whatever excites the uterus, directly or indirectly, may induce the same effect: hence, too great indulgence in venery, or any direct excitement of the organs of reproduction; great fatigue in the erect posture; substances, that powerfully excite the urinary organs, as savine, turpentine, &c., are exciting causes.

Where a female has aborted more than once about the same period, the predisposition to the recurrence of hyperæmia in subsequent pregnancies is often so great as to resist every effort on the part of the practitioner.

Treatment.—Where the condition of the patient will bear it, blood may be taken either from the arm, or, in the way of revulsion, by cupping or leeches, from the region of the loins. A recent writer (*Simpson*) affirms, that he has known good effects from the application of a few leeches to the cervix uteri immediately before, or at the commencement of the menstrual period, when the hyperæmia has been urgent; but this course is disagreeable to the patient, and can rarely be necessary. In such cases, the menstrual flux itself relieves the hyperæmia, and, therefore, little is needed beyond the horizontal posture, and mental and corporeal quietude, which are required, indeed, in all cases.

In debilitated habits, where blood cannot be drawn, dry cupping may be used on the lumbar region.

2. *Inflammation of the Uterus.*

SYNON. Inflammatio uteri, Metritis, Hysteritis, Empresma hysteritis; *Fr.* Inflammation de la matrice, Métrite; *Ger.* Gebärmutterentzündung, Entzündung der Gebärmutter.

Inflammation of the uterus may occur both in the unimpregnated and in the impregnated state; but the acute form is less common in the former, whilst the more chronic varieties are frequently met with. It may be seated in the serous or in the mucous coat, or may affect both of these simultaneously with the substance of the viscus. It is this last condition, which we shall describe first, and afterwards allude to the inflammation of the lining membrane that gives occasion to uterine leucorrhœa.

a. *Inflammation of the Substance of the Uterus.*

Diagnosis.—Acute metritis is characterized by the following symptoms. Preceded by, or along with, the ordinary constitutional symptoms of internal inflammation, pain is felt deep in the pelvic region, with occasional attacks of acute pain in the back, shooting through to the symphysis pubis, and down to the groins and thighs; the pain is not augmented on gentle pressure, but is greatly so, if much pressure be exerted downwards from above the brim of the pelvis, as well as during coughing or sneezing. There is often, also, a sensation of bearing down, and difficulty in micturition.

If an examination be made *per vaginam*, the cervix uteri may be found swelled, and very tender on pressure; and after the disease has continued for some time, there may be more or less abdominal swelling.

These symptoms succeed, at times, to obstruction of the catamenia, so as to leave no doubt as to the nature of the affection. The constitutional symptoms vary greatly. At times, the fever is high; but this is not common; nor is the disease very frequently fatal.

It may, however, assume the chronic form and give rise to very serious organic mischief.

Causes.—The same causes, that induce hyperæmia of the uterus, may equally occasion acute metritis. It may be caused, also, by the ordinary influences that excite phlegmasia of internal organs.

Pathological characters.—The tissue of the uterus may be swollen, of a blackish red colour, softened, friable, and engorged with blood mixed with a sero-purulent fluid; and, occasionally, small abscesses, filled with pus, are met with here and there, or even larger accumulations. The uterine veins may be filled with pus, as well as the vessels proceeding from them. Occasionally, the tissue of the uterus is found to be so much softened, as to tear readily when the finger is pressed upon it; and, still more rarely, there are evidences of a gangrenous condition. (*Duparcque, Churchill.*)

Treatment.—This is essentially the same as that required in other internal inflammations,—blood-letting, general and local; cups to the loins, and leeches to the vulva. The tartrate of antimony and potassa may, likewise, be given so as to produce a nauseant effect; warm fomentations may be employed; and if the disease does not yield, counter-irritants may be applied—as sinapisms or frictions with croton oil, which are better perhaps—as has been suggested, (*Simpson*,)—than cantharides, owing to the latter irritating the bladder at times, and sympathetically increasing the uterine inflammation. Irritating cathartics ought not to be employed for a similar reason; but the bowels may be kept free by gentle laxatives, as castor oil, or by emollient injections, which act beneficially also as fomentations on the inflamed uterus.

Chronic inflammation of the uterus may be the sequel of the acute; or it may be chronic in its characters from the commencement. The symptoms often come on very insidiously; and are similar to those of the acute form but less in degree. There is, generally, more or less disturbance of the digestive functions, so as to distract the attention of the practitioner from the real seat of the mischief, and to lead to the idea, that the primary seat of deranged action is there. There is no form of disease in which reflected action is more seen than in chronic metritis and its consequences: although the irritation may be primarily seated in the uterus, the manifestations may be more strikingly exhibited in other and distant parts of the economy.

The treatment of this affection does not vary from that appropriate to chronic inflammation of other internal organs. The main reliance has to be placed on counter-irritation, emollient or anodyne fomentations, thrown into the vagina or rectum; with the internal use of mercury—as of calomel combined with opium—given so as to gently exert its revellent action upon the mouth.

All the exciting causes should of course be avoided; and if the patient be married, it will be advisable, that she should sleep apart

from her husband. Should *hypertrophy of the uterus* result, the preparations of iodine will be found of the greatest service.

b. *Inflammation of the Lining Membrane of the Uterus.*

SYNON. Endometritis.

It has been already seen, that inflammation may affect the lining membrane at the same time with the substance of the uterus; but, not unfrequently the phlegmasia is restricted to the lining membrane, where it assumes different characters,—at times being *ulcerative* and following acute metritis in the puerperal state, —or succeeding to chronic metritis, when it is generally restricted to the region of the cervix, and is seated, most commonly, on the vaginal surface of the posterior lip. (*Simpson.*) The ulcerations are usually very superficial, and cannot, consequently, be detected without the aid of the speculum.

Another form of inflammation is the *membranous*, in which coagulable lymph is thrown out, which takes the shape of the cavity, as a similar plastic effusion does in cases of croup. It may, however, be thrown off in the form of shreds along with the catamenia, so as to give rise to a very painful form of dysmenorrhœa. Occasionally, too, as the result of chronic inflammation, the mucous follicles of the cervix and os uteri become permanently enlarged; and distinct red granulations are, at times, thrown out, like those of granular inflammation of the conjunctiva. (*Simpson.*)

Chronic metritis gives occasion to one form of leucorrhœa.—*Uterine leucorrhœa, Fluor albus uteri, Medorrhœa uteri, Metroblennorrhœa, Whites, Suppurative inflammation of the uterus; Ger. Weisse Fluss der Gebärmutter.* That which takes place from the vagina has been already described; and it has been shown, by dissection, that a similar discharge may take place from the lining membrane of the uterus, either alone or along with the vaginal leucorrhœa. The source of the discharge, in these cases, is indicated by its increase immediately before or after a monthly period, by pain in the uterus, and by the discharge assuming, at those times, a more purulent appearance,—facts which are said not to hold good with regard to vaginal leucorrhœa.

Chronic suppurative inflammation of the uterus may be either an idiopathic affection, or may be excited and kept up by the presence of tumours, polypi, &c. in the walls or cavity of the uterus itself; and when the os uteri is obliterated by inflammation or other causes, the pus may accumulate within, and distend, the uterine cavity. (*Simpson.*)

This form of leucorrhœa is by no means as much benefited by astringent injections as the vaginal; it would appear, indeed, that at times, they cause great irritation and an aggravation of the local distress. (*Churchill.*)

The acute form requires cupping in the loins, with the hip bath, and warm emollient injections into the vagina and rectum; and

after the active stage has passed away—or, at any time during the chronic form, counter-irritants may be applied to the sacrum—as the ointment of tartarized antimony, croton oil, or dry cups. If a blister be applied, it ought not to be kept on too long, and its surface should be covered with tissue paper, to prevent, if possible, the absorption of the flies, or their active principle.

Internal remedies are generally of but little use, with the exception of such as are directed to the accompanying condition of the constitution,—chalybeates for example. It may be proper to remark, however, that, of late, the secale cornutum is said to have succeeded, where other remedies have failed. It may be given in the dose of five grains three or four times a day. (*Negri, Langlet, Churchill.*) The following powders have likewise been recommended. (*Ryan.*)

R.—Secalis cornuti, ℥ij.

Pulv. cubebæ, ℥j.

Pulv. cinnam. c. ℥ss.

Sacchar. purif. ℥j.—M. et divide in chart. viij.

Dose, one, three or four times a day.

In the latter stages of the disease, gentle astringent injections, similar to those advised under Vaginal Leucorrhœa, may be thrown into the vagina; and the lower part of the abdomen and back may be sponged with tepid water: attention to cleanliness is, of course, essential.

b. FUNCTIONAL DISEASES OF THE UTERUS.

The functional diseases of the uterus concern the monthly secretion, which takes place from that viscus, from the period at which the young female becomes nubile, until the “critical time of life,” when the secretion is wholly arrested. The age, at which it commences in this climate, varies greatly in individuals; the most common period, however, is from thirteen to fifteen years, and the usual time of its cessation, in the temperate zone, is between forty and fifty years. Many exceptions, however, occur to this; in rare cases, the catamenia have appeared at a very early age, even in childhood;—and, again, they have continued, with powers of fecundity, greatly beyond the age specified. The quantity of fluid lost varies, too, greatly, and scarcely admits of appreciation. It has been estimated at from six to eight ounces, in temperate climates.

The menstrual fluid is evidently an exhalation from the vessels of the uterus; but difference of sentiment has existed, as to whether the fluid is simply blood, or so changed from blood, as to be esteemed a secretion. The author is rather disposed to embrace the latter opinion, but many eminent observers adhere to the former. It is not, however, a matter of moment in a pathological or therapeutical point of view; for all admit, that, at each menstrual period, the uterus becomes the seat of hyperæmia, or of irritation, or of both, and of a loss of fluid directly or indirectly from the uterine vessels; but it is as impracticable for us to say, why this irritation is re-

newed monthly, as it is to explain why the predominance of one organ succeeds that of another in the progress of life. (*Adelon.*) The function is as natural, as instinctive to the female, as the development of the whole sexual system at the period of puberty.

As a general rule, the appearance of the menses denotes the capability of being impregnated, and their cessation the loss of such capability. Yet it would appear, that females have become mothers without ever having menstruated, (*Fodéré, Morgagni, Sir E. Home, Ferguson;*) although this has been denied. (*Professor Dewees, of Philadelphia, Campbell.*)

Whilst menstruation continues, the system is unusually irritable; and hence hysteria is very common in impressible females, and especially in such as have had previous attacks. It has, already, too, been remarked, that all organic affections of the uterus are apt to be augmented during the hyperæmia, which precedes their establishment. (See the author's *Human Physiology*, 3d edit. ii. 351, Philad. 1841.)

1. DISORDERS OF MENSTRUATION.

SYNON. Paramenia, Mismenstruation, Menstruatio anomala, Menses anomalæ; Ger. Krankhafte monatliche Reinigung.

The disorders of menstruation may be divided into—1. Cases in which the function has never been established; or, after having been so, is suppressed, constituting *Amenorrhœa*. 2. Those in which the function is executed with pain and difficulty—*Dysmenorrhœa*. 3. Those in which it takes place from other parts than the uterus—*Vicarious menstruation*; and 4. Those in which the flow is excessive—*Menorrhagia*. Each of these will require a distinct consideration.

1. *Suspended Menstruation.*

SYNON. Amenorrhœa, Paramenia obstructionis; Fr. Amenorrhée, Suppression du flux menstruel; Ger. Amenorrhœe.

Two forms of amenorrhœa may be pointed out,—one in which the catamenia have never appeared; and another, in which, after having appeared, they become obstructed.

a. *Retention of the Menses.*

SYNON. Emansio mensium, Amenorrhœa emansionis; Paramenia obstructionis emansio, Menstruatio retenta, Menoschisis, Absent menstruation; Ger. Verhaltung der Menstruation.

Although—as already remarked—the menstrual secretion generally commences from the thirteenth to the fifteenth year; yet it is sometimes retarded much beyond the ordinary period.

Causes.—The menses may be retained from various causes. The author has elsewhere shown, that the view is more and more entertained, that menstruation is dependent upon changes occurring periodically in the ovary, and that where females, who have died during menstruation, have been examined, evidences have been found of the rupture of an ovarian vesicle, (*Cruikshank, Robt. Lee,*

Gendrin,) whence it has been inferred, that, during the whole of the period of life, when the capability for conception continues, there is a constantly successive development of ovarian vesicles and their contained ovules,—that, at each epoch of menstruation, a vesicle, having reached the surface of the ovary, becomes the seat of a peculiar organic action, in which all the organs of generation participate, and that the result of this action is the rupture of the vesicle, and the loss of the infecund ovum, either by expulsion from the uterus or by destruction in the ovary. (*Human Physiology*, edit. cit., ii. 355.)

It can hence be understood, that if the ovaries be wanting, amenorrhœa may be a necessary consequence; and that where they have been removed, the function, although previously existent, may be arrested. Where the ovaries are wanting from birth, the organic actions generally may be well performed; the only function which is necessarily absent being that of reproduction. In such case, no development takes place at puberty, as in the well formed female; but she acquires characters that approximate her, in some respects, to the male; the mammæ are generally not developed; the voice is more raucous than that of the female, and beard appears upon the upper lip. A similar approximation is observed in the elderly female, after the ovarian functions have ceased for some time. (*Mehlis*.)

Absence of the uterus, or defective formation, may equally interfere with the menstrual function; and the same result may follow from closure of the canal leading into the uterus, at the os or cervix uteri, or from natural or accidental atresia or imperforation of the vagina. A firm hymen has so completely closed the vagina, that, although the function may have been executed in the uterus, owing to the fluid not being able to escape, there have been no outward signs of menstruation; and it has happened that the fluid has accumulated so as to distend the uterus to bursting. (*Churchill*.) The author has known cases, in which entire relief has been afforded by the division of the membranous impediment to the exit of the catamenia.

Congenital absence of the uterus does not interfere with the health, because it is a part of the formation proper to the individual; where, however, the organs are there, and the secretion takes place but cannot escape, the health is always more or less impaired; and, at particular periods, the patient is liable to pain in the back; sense of fulness in the uterine and vaginal regions; bearing down efforts, with tumefaction, and often great tenderness of the abdomen, especially of the hypogastric region.

If these signs exist, the ovaries and uterus are probably both present; but should there be any doubt, a careful examination must be made. Many cases of absence of the uterus are recorded, and have recently been collected. (*Professor Chew*, of Baltimore.)

Where there is no congenital defect, but the menstrual function is not established at the usual period, and the other developments,

that should occur at puberty, are not apparent, the general health being good, the case may be merely one of "tardy puberty;" but where the usual changes have occurred, and the catamenia are alone defective; and especially if ineffectual efforts are made monthly, as indicated by the ordinary signs of hyperæmia of the uterus, with impaired health, the case may require the attention of the physician. This state may be either accompanied by signs of the polyæmic or anæmic condition—more frequently perhaps the latter; the health suffers; nervous and hysteric phenomena exhibit themselves; the digestive function is imperfectly and capriciously executed; the circulation is always more or less affected, and all the anomalous symptoms may present themselves, which are referred to under Chlorotic Cachexia.

It is all important to bear in mind the existence of these two opposite conditions in amenorrhœa, inasmuch as it may prevent the indiscriminate reliance on reputed emmenagogues, which so strongly characterizes the practice of the uninformed, and by which much mischief is occasioned.

b. *Suppression of the Menses.*

SYNON. *Suppressio mensium, Paramenia obstructionis suppressio, Amenorrhœa suppressionis, Menstruatio suppressa, Menostasis, Suppressed menstruation; Ger. Unterdrückung der Menstruation.*

Under this head are considered cases in which menstruation, after having been once established, is arrested suddenly or gradually.

In regard to the fact of such suppression, we have to be guided by the testimony of the patient; and, as respects chronic suppression, we may be deceived by her. She may complain, for example, of suppression having occurred two or three months previously, and may have recourse to medical aid, when she knows that she has exposed herself to causes which may have given rise to it, but which it is important for her to conceal. One of the earliest signs of pregnancy—it is well known—is the suppression of the menstrual function; and, during the first months of utero-gestation, it is a matter of great difficulty to distinguish between suppression from natural causes, and that which is induced by morbid agencies. Generally, in the former, there is morning sickness; and, in the course of time, a development of the areola and of the sebaceous follicles about the nipples. In the course of three or four months, too, the general health is reëstablished, whilst in true amenorrhœa suppressionis, the health commonly continues impaired. The difficulty of diagnosis can only exist, however, prior to the period of quickening; for, at this time, and afterwards, other signs of pregnancy exist, which have been detailed elsewhere, and which leave little or no doubt as to the nature of the case. (*Human Physiology*, 3d edit. vol. ii. Philad. 1841.)

When the function is suddenly suppressed, as by irregular exposure to cold during the existence of menstruation or some power-

ful mental emotion, or bodily disease, signs of febrile irritation may develop themselves sooner or later, accompanied by local inflammation in one or other of the viscera of the three great splanchnic cavities. At other times, the uterus becomes the seat of severe pains, which appear to be of the neuralgic kind. Perhaps, indeed, the most common effect is one of an entirely neuropathic character; and, not unfrequently, the form it assumes is temporary insanity or a severe variety of hysteria.

To acute suppression of the menses, we can refer cases of insanity with more probability than to the chronic form, which may supervene gradually without materially interfering with any of the functions. Indeed, not unfrequently, chronic suppression of the menses is connected with the bodily condition, which is itself the cause or the accompaniment of the insanity, and both occasionally disappear as that condition is modified.

Treatment of amenorrhœa.—When menstruation is obstructed by any malformation, this must be obviated where practicable. If it be caused by any occlusion of the vulvo-uterine canal, the aid of the surgeon becomes necessary. At times, as already remarked, a membrane covers the os uteri, or the canal of the cervix is imperforate. In the former case, it has been proposed to make an artificial canal by means of a trocar, or an instrument resembling that used by Stafford for dividing strictures of the urethra, (*Churchill*;) but it need hardly be said, that such an operation should be decided upon, and executed with exceeding caution. Where a membrane over the os uteri is the obstacle, it may be punctured or ruptured, and a probe or small bougie be passed into the uterus, as described under Painful Menstruation. This has been done, and with great success. (*Mackintosh*.) Such a condition may be a positive impediment to conception, and hence its removal may have the additional effect of removing this impediment.

In all cases of amenorrhœa, the pathological cause of the obstruction must be carefully inquired into, and, if practicable, removed. Where retention of the menses is connected with a plethoric condition of the system, or suppression of the menses is of the acute character described above; antiphlogistics are demanded, with the horizontal posture, and all the remedies that are required in internal inflammation. In the severest forms, where death has occurred in a few days, inspection would seem to have shown, that it has been caused by phlebitis. (*Ferguson*.) In such cases, the only hope of safety is in the active employment of a sedative treatment.

The mass of cases of amenorrhœa are, however, of the chronic form; and although these may be accompanied by asthenic phenomena in some cases, and by sthenic phenomena in others, the number of cases of the former largely predominates, and hence it is, that chalybeates are generally ranked amongst the most important emmenagogues.

The author has elsewhere remarked, that much harm has arisen

from a belief in the existence of direct emmenagogues, as it has led to the use of special agents, without discriminating the causes, that may have given rise to the amenorrhœa. In all cases, such causes must be appreciated, and the treatment be directed to their removal, as well as to that of the morbid condition of the uterus produced by them. (*General Therapeutics*, p. 268.)

Where the suppression is connected with polyæmia, and there are symptoms of the *molimen menstruale* present, as indicated by the evidences already described of polyæmia of the uterus, it may be necessary to take away blood from the arm; or by cupping over the lumbar or sacral region, or by the application of leeches to the vulva or thighs; and in the intervals between the menstrual efforts, the diet should be restricted, and consist of aliments not too nutritious. Exercise should, likewise, be taken short of inducing fatigue, and a cathartic be prescribed occasionally. On the recurrence of the next menstrual period, the hip bath, and warm, simple or sinapised pediluvia, frictions to the loins with stimulating liniments and an aloetic cathartic, which acts on the uterus by contiguous sympathy, may be used; and they will, occasionally, be successful.

When, on the other hand, the suppression is associated with a want of tone in the system generally, an opposite course of treatment becomes advisable. A brisk cathartic may here, also, be necessary at first, and even afterwards,—but it should be followed up by the use of tonics and of every mode of improving the general health. The great rules for this purpose, and the modes for carrying them into effect, are laid down under Anæmia and Chlorotic Cachexia. Of the therapeutical agents, chalybeates have been most employed, and of these the protocarbonate and the precipitated carbonate of iron have been extolled of late years. (See *Chlorotic Cachexia*.)

The constitution should be invigorated by proper attention to diet; exercise; bathing, especially the shower bath, change of air, particularly to the seaside, and the employment of sea-bathing, where this is practicable.

In addition to these general agencies, on which alone much dependence can be placed, many reputed emmenagogues have been administered, but they cannot be relied upon. Those, of whose power of acting on the uterus there is the least doubt, in the opinion of a recent writer, (*Churchill*), are iodine, ergot and strychnia; yet it may be questioned, whether these or any agents have an effect, which adapts them for all cases, and merits for them the title of “emmenagogue.” The iodine may be given in the form of the *tinctura iodini composita*, of the London Pharmacopœia, (gtt. x—xxx, three times a day.) The ergot may be prescribed in powder, (gr. v—x, two or three times a day;) and the strychnia in the form of tincture.

R.—Strychniæ, gr. iij.

Alcohol, ℥j.—M.

Dose, 6 to 24 drops, twice or thrice a day.

Of twelve cases of suppressed menstruation, treated with strychnia by one practitioner, (*Bardsley*), ten were cured, and two relieved; and a more recent writer (*Churchill*) had two cases, in which the cure by it was complete and permanent.

A very recent intelligent writer (*Ferguson*) classes these and other agents that have been employed under the title of "nostrums." "There are numberless nostrums," he remarks, "of greater or less value, which, from their very number, prove how capricious a disease is amenorrhœa, and how curable. Dale excites the mammæ by repeated application of one or two leeches; the organ enlarges greatly, and the uterus sympathizes on being thus aroused. Very many authors give five to eight grains of ergot. Carron du Villard recommends cyanuret of gold in minute doses; Bradley gives strychnine, Brera, iodine; Amussat applies an exhausted glass to the uterus; and Rostan, leeches."

Of excitants, directed more immediately to the uterus, may be enumerated,—electricity or galvanism transmitted across the region of the uterus, which is probably one of the best; and irritating the uterus itself by the introduction of bougies, and stimulating injections into that viscus,—as for example, of a few drops of liquor ammoniæ to an ounce or two of milk. This has been properly stigmatized, however, as a hazardous measure, and one which may induce metritis. (*Churchill*.) The injection, when thrown into the vagina, has been spoken of favourably. (*Blundell*.)

On the whole, then, it is evident, that the cause of suppressed menstruation must always be minutely investigated, before the physician attempts to prescribe. Without obtaining such a knowledge of the state of the organ, and ascertaining how far the suspension or irregularity is due to the condition of the organ itself, or to that of the general system, our practice must ever be uncertain; in floundering about and trying various remedies, without rule or discrimination, we may, it is true, stumble by accident on something effectual; but much evil may be previously produced. (*A. T. Thomson*.)

2. Painful Menstruation.

SYNON. Dysmenorrhœa, Paramenia difficilis, Amenorrhœa difficilis, Menorrhagia difficilis, Dysmenia, Menstruatio difficilis, M. dolorifica, Laborious menstruation; *Fr.* Dysmenorrhée; *Ger.* Erchswerter Monatsfluss.

Dysmenorrhœa differs from amenorrhœa—in menstruation being accomplished, but with great pain, which may commence a day or two before, or not until immediately preceding the flow. The pain is generally intermittent, and it differs in degree, from constant soreness to agonizing dartings or "colics." (*Ferguson*.) Along with the uterine pain, there is, commonly, more or less constitutional disturbance,—at times, febrile excitement; but, at others, merely disorder of the digestive function—as indicated by vomiting and diarrhœa with tenesmus. Occasionally, too, there is scalding pain on passing the urine. Frequently, the system is extremely

impressible, so that hysteric and hysteroid affections are concomitants. As soon as the catamenia flow, these symptoms generally become mitigated, and gradually pass off.

Dysmenorrhœa may occur with different conditions of the menstrual discharge. Sometimes, it is as copious as usual; at others, to a greater extent; but, more frequently, it is diminished in quantity; and it is not uncommonly mixed with shreds apparently of coagulable lymph; and at times a coat, similar to the decidua uteri, which has the shape of the cavity, is met with. These last cases are usually combined with symptoms denoting inflammatory excitement; and, have given occasion to a variety of dysmenorrhœa, termed *inflammatory*, to distinguish it from the *neuralgic*, as well as from that which arises from mechanical impediment to the flow, and hence termed *mechanical*. (*Churchill*.)

Painful menstruation not only gives rise to great suffering monthly; but, especially when membranous, is a positive impediment, in most cases, to conception. Fortunately, the majority of cases are not of the last kind.

“From an attentive examination of these cases,” observes a recent writer, “I have been led to the conclusion, that the disease is most frequently of a simple neuralgic character. We have no evidence of any inflammatory process going on; the pulse is rather weaker, and scarcely, if at all, quicker; the skin is cool, and the remaining functions undisturbed. In short, there is no proportion (as there is in inflammation generally) between the amount of local distress and constitutional suffering. The womb appears to be in a state of great irritability.” (*Churchill*.)

Causes.—Dysmenorrhœa may be induced accidentally by powerful mental emotions; or by anything which interferes with the process; hence, it may be owing to cold. We meet, however, with cases, in which it is difficult to discover the precise causes; and in which the female at every catamenial period suffers excessively, and is only relieved by the cessation of the menses. It is affirmed, that sexual intercourse immediately previous to the expected flux, has excited the severest forms of the disease. (*Ferguson*.)

Treatment.—The treatment resolves itself into that which is proper during the interval, and that required during the attack. It is impossible to lay down any positive rules in regard to the former. The condition of the system must be narrowly investigated; and if the disease be owing to unusual impressibility, accompanied with want of tone in the system generally, a plan of treatment is required, which is adapted to improve the general health. With this view, the tonics and chalybeates recommended for the asthenic form of amenorrhœa are advisable here, with regular air and exercise, and the use of the warm or cold bath. Immediately, too, before the expected period, it may be advisable to make a new impression on the nervous system by full doses of opiates.

Where, on the other hand, the dysmenorrhœa is accompanied by inflammatory symptoms, the antiphlogistic regimen should be

adopted in the interval, and immediately before the expected period, it may be advisable to draw blood from the arm, or from the loins by means of cupping, and to prescribe immersion in the warm bath. In the congestive and inflammatory varieties, if they may be so termed, rest is very important. The patient should be directed to confine herself to the horizontal posture for five or six weeks,—during which time, such remedial agents may be prescribed as the case may suggest. During the paroxysm, blood may have to be drawn in the more active variety; and, in all cases, the severity of the suffering must be allayed by full doses of opium, or of some of its preparations. Warm applications may, likewise, be made locally, in the form of fomentations, or of partial or general baths.

Where no mechanical impediment exists to the flow of the catamenia, rigorous attention to appropriate measures may enable the female to pass one menstrual period without suffering; and if she be married, and be fortunate enough to become pregnant immediately afterwards, the resulting pregnancy and subsequent period of lactation may so far break in upon the morbid predisposition, that when the catamenial function is re-established, the dysmenorrhœa may not recur. In one or two cases, that have fallen under the author's care, this desirable event has been favoured by the new impressions made during travelling.

Allusion has been made to a variety of dysmenorrhœa, termed "mechanical," which has been ascribed to the small size of the os uteri, or to a narrowness or stricture in some part of the canal of the cervix. (*Mackintosh, Churchill, Professor Meigs*, of Philadelphia.) To remove this affection, it has been proposed to introduce a common metallic bougie, of which there are various sizes, from that of the metallic probe upwards. When Dr. Mackintosh published the 4th edition of his "*Principles of Pathology and Practice of Physic*"—he had treated twenty cases by dilating the os uteri, and had permanently cured eighteen. After that period he had other successful cases; as a recent writer (*Churchill*) states, that he had employed dilatation in 27 cases, and cured 24; of whom 11 had since borne children.

The operation may be performed—the patient lying on the left side—by introducing the index finger of the left hand until it reaches the os uteri, for the purpose of directing the instrument to the part, which is then to be gently insinuated by a rotatory motion, until it arrives at the fundus of the uterus. Much force ought not to be employed, and little or no pain is said to attend the operation.

That dysmenorrhœa may be induced by this cause can scarcely, perhaps, be denied; yet we doubt not, that this is rare, inasmuch as such a condition of the organ would prevent the flow of the menses altogether, or, in other words, occasion amenorrhœa; and—as has been already seen—in many cases of dysmenorrhœa, the discharge is more copious than usual.

It has been properly suggested, too, that the employment of a

bougie may act beneficially, by inducing a new action in the parts with which it comes in contact; and that this may be the beneficial agency, rather than the mere mechanical dilatation. (*Ferguson.*)

No allusion has been made to the various articles of the *materia medica*, which have been favourites with particular practitioners; as not one of them exerts any special agency over the morbid condition.

3. *Vicarious Menstruation.*

SYNON. *Paramenia erroris; Menorrhagia erronea, Mensium per aliena loca excretio, Aberratio mensium, Menses devii, Hæmatoplasia; Ger. Verirrungen der Menstruation, Menstruation auf ungewöhnlichen Wegen.*

Singular cases are on record, in which, during amenorrhea, a discharge has taken place from some other organ, which has possessed the usual odour of the catamenia, but has generally seemed to consist of pure blood. No accurate analysis of the fluid has, however, been made; and, therefore, it is impossible to pronounce, whether the natural and the vicarious discharge were essentially identical. The whole subject of vicarious secretion is singular. We observe parts secreting from the blood ossific and other matters under special circumstances, not capable of appreciation; and, in the same manner, during the *molimen menstruale*, if the catamenia cannot be separated by the ordinary outlets, a discharge may take place *vicariously* from other organs. Thus, we have cases recorded of vicarious menstruation from the eyes, nose, alveoli, ears, nipples, stomach, intestines, urinary organs, umbilicus, fingers, skin, &c. (*Cruikshank, Richerand, M. Good.*)

Recently, two cases of this nature have been reported. (*Fingert-huth.*) In one, during suppression of the catamenia, in a healthy girl, eighteen years of age, the bleeding took place from a whitlow on the finger. The other case occurred in a girl, seventeen years of age, who had often felt the menstrual effort—without the occurrence of menstruation. She had suffered for some time under dyspnœa, palpitation, &c. when, one morning, she found the right breast bloody. On examination, it was found that the flow proceeded from a nipple-like excrescence on the breast. The phenomenon recurred irregularly for some time, until, ultimately, uterine menstruation was properly established.

Treatment.—In all cases of vicarious menstruation it is important to inquire into the cause of the aberration; both as regards the system in general, and the uterus in particular; and, moreover, to attend to the condition of the part whence the vicarious discharge proceeds: most commonly, perhaps, this is from the stomach, and it is generally an affection of but little moment.

The remedies usually demanded, are those recommended under Amenorrhœa. The state of the system is commonly one of asthenia, and, accordingly, chalybeates are needed, with all the tonic agencies advised under that head. Unless the condition of the system contra-indicates its employment, bleeding, either from the arm, or from the loins by cupping, to the extent of from four

to eight ounces, immediately before the expected period, and the use of a saline cathartic¹ for a week previously, may prevent the afflux to the organ vicariously affected; and the case may be converted into one of simple amenorrhœa. (*Ferguson.*)

¹ R.—Magnes. sulphat. ℥ij.

Acid. sulph. dil. gtt. xv.

Aquæ, ℥vj.—M.

Dose, a tablespoonful, night and morning.

The treatment will, of course, have to be modified according to the particular parts that may be concerned in the vicarious discharge. It has been properly remarked, that the state of the organ probably assists in determining the discharge to it, just as when the skin is ulcerated, the vicarious flux will be seen to exude monthly from the diseased rather than from the sounder surface. (*Ferguson.*)

Hence it is, that vicarious hæmoptysis is perhaps of more consequence than any other form; and partly, also, because there is danger—even if the discharge should be a mere transudation of blood through the parietes of the containing vessels—that a predisposition may be left to some other pulmonary affection.

4. Menorrhagia.

SYNON. Hæmorrhagia uteri, Metrorrhœa sanguinolenta, Hysterorrhagia, Hæmorrhœa, Metrorrhagia non gravidarum, Immoderate flow of the menses, Excessive menstruation, Uterine hemorrhage; *Fr.* Hémorrhagie de l'Utérus, Hémorrhagie utérine; *Ger.* Gebärmutterblutfluss, Mutterblutung.

The word menorrhagia has been used in different significations: sometimes, merely to indicate—in accordance with its derivation—a more copious flow than usual of the catamenia at the regular monthly periods: more commonly, however, it is extended to cases, that appear to be directly or indirectly connected with the menstrual function. It is not easy to discriminate those cases at all times, and consequently, it is better perhaps to include under the term all those abnormous sanguineous discharges, that occur in the unimpregnated uterus. This definition, of course, excludes the uterine hemorrhage, which occurs as a complication of pregnancy and parturition; and which is dependent upon very different causes from the hemorrhage now under consideration. It has, indeed, been proposed, that the term menorrhagia should be applied not only to an increase in the catamenia, without any admixture of other fluids, but to any discharge of blood that may accompany or succeed the menstrual evacuation, (*Locock*;) whilst uterine hemorrhage should be applied exclusively to flooding connected with pregnancy and parturition, (*Locock, Churchill*;) and it is in this sense, that it will be employed here.

It not unfrequently happens, that the flow at the monthly period is so much more copious than usual, that it resembles more a case of flooding than one of ordinary menstruation. Still, the discharge possesses the peculiar odour of the catamenia, and if it be esteemed pure blood—as it is by some—it must be admitted that

it does not contain the ordinary quantity of fibrine, for it does not coagulate. Profuse menstruation may, however, be combined with unquestioned hemorrhage from the uterus; and in such case, a portion of the blood may coagulate, as under ordinary circumstances.

Copious menstruation cannot always be regarded as a disease. There are some females, who always menstruate largely, but whose health does not appear to suffer; but when the discharge takes place more frequently and freely than usual, and manifestly produce an injurious effect on the general health, it is a condition, which requires the attention of the practitioner. It is often, too, found to alternate with leucorrhœa.

At other times, true blood, differing but little, if at all, from that which flows in the veins, is discharged copiously and irregularly so as to make serious inroads in the health of the female. This is especially the case about the period of the cessation of the menses, when the hemorrhage may be so great as to excite alarm,—the patient becoming debilitated, pale, and, if the discharge continue long, almost exanguious,—presenting, in fact, all the characters of anæmia, with the functional disorders elsewhere described as resulting from it. (See Anæmia, and Chlorotic Cachexia.)

Causes.—An immoderate flow of the menses or true uterine hemorrhage may occur in the plethoric, as well as in those of an opposite habit, where there is no organic disease of the uterus.

Not unfrequently, however, it is a mere symptom of uterine disease, and especially of polypus; of corroding ulcer or cancer of the uterus, hydatids, &c. Hence the necessity, in obstinate cases of menorrhagia, of making an accurate examination into the condition of the uterus.

As not uncommon causes of functional menorrhagia are reckoned;—heated rooms, and warm bathing carried to excess; “mechanical irritations, excessive venery, some of the pathemata, as fear or anger,” have been classed amongst the predisponent causes. (*Ferguson.*)

In one predisposed to the disease, all severe exercise in the upright posture, as riding on horseback, or in a carriage not well hung, or over rough roads, may induce it. It can be readily understood, too, that whatever diminishes the consistence of the blood, will facilitate its transudation through the uterine vessels, and hence, that chlorosis and every form of anæmia may be accompanied by uterine hemorrhage, as they are apt to be attended by transudations of blood from other mucous membranes.

Treatment.—Where the case is simply one of greater flow of the menses than usual, it may pass off without farther cares than confinement to the horizontal posture on a hard mattress or couch; but, occasionally, evidences of active hyperæmia of the uterus exist, which may require the abstraction of blood from the arm, or by means of leeches to the anus, or of cupping on the loins. (*Locock.*) More frequently, however, the affection occurs in persons of a

habit opposite to the plethoric, and where abstraction of blood to any amount is inadmissible. In such cases, and indeed in hyperæmia of the uterus occurring in any habit, it has been advised to apply a few leeches—one to four—to the cervix uteri by means of the leech tube. (*Ferguson.*) The remedy is, unquestionably, of occasional service; but there are so many inconveniences attendant upon its application, that it is not often used. The author has seen inflammation of the lining membrane result from the leech-bites, and, in one case, alarming hemorrhage, which could only be checked by the most powerful astringents, aided by plugging the vagina.

During the interval between the regular periods, every endeavour must be made to appreciate the pathological condition, that gives occasion to the immoderate flow; and if it be found to be dependent upon too great fulness of blood, the diet should be restricted: and for some time before the expected period, the patient should keep the horizontal position, and a few ounces of blood may be taken in the manner already directed.

Where, on the other hand, the system is asthenic, it may be advisable during the attack, as well as in the intervals, to administer tonics. The preparations of iron—advised under Chlorosis—are here appropriate; and if the patient can have the advantage of sea air and sea bathing in the proper season, it may be highly advantageous.

It can rarely perhaps be advisable in simple immoderate flow of the catamenia, to throw any astringent injections into the uterus. It is affirmed, indeed, that the discharge has been suddenly arrested by them, and inflammation of the uterus has followed.

In the menorrhagia, which consists in true hemorrhage from the uterine vessels, the same inquiry is essential as to the causes that may be concerned in its production—whether, for example, it be owing to polyæmia, or to a condition approximating rather to anæmia; or, again, to some organic disease of the uterus itself; and, as in other hemorrhages, the treatment has to be modified accordingly; in one case, blood-letting, and the whole antiphlogistic treatment and regimen being needed; whilst, in the other, an opposite course may be advisable. There is not the same objection to astringent injections in this form of menorrhagia as in that which consists merely in an increase of a natural secretion or discharge; and, accordingly, astringent injections are much used by many practitioners, especially where the disease is of the chronic kind. Any of the astringent injections, advised under leucorrhœa, may be prescribed for this purpose. During the activity of the discharge, especially if signs of hyperæmia of the uterus exist, the lumbar and sacral regions may be sponged with cold water, or cold vinegar and water, and cloths dipped in the same may be applied to the vulva; but care must be taken, that too great a shock be not induced by the impression of the cold, as the blood might, under such circum-

stances, be distributed irregularly towards the internal parts of the organism, and an increase of the hemorrhage be the consequence.

Should the discharge be excessive, the tampon or plug should be used, which will generally arrest it.

By treating the disease on general principles, the acute stage—if it may be so termed—will pass away in a few days, and the flow may entirely cease; but, in other cases, it becomes chronic. It is, in such cases, that astringent injections are most advantageous. Remedies, of the astringent class, too, are generally administered internally, but they are certainly of limited utility. As before remarked, the condition of the system has to be attended to in all cases of hemorrhage, and we probably obtain but slight advantage from internal styptics. Many modern writers (*Ferguson, Churchill*) have spoken well of the *secale cornutum* in such cases, (Pulv. secal. cornut. gr. v—xviii, three times a day;) but further observations as to its efficacy, are needed. The same may be said of the *mone-sia*, an article of modern introduction, (Mones. gr. iij, every hour or two.) It has been given by different practitioners, (*Dagnac, Payen, Alquié, Martin Saint Ange, Chaloner*, of Philadelphia, *Burns*, of Frankford, Pa.,) in various forms of hemorrhage from the uterus; but perfect rest, cold drinks, and other appropriate agencies were recommended at the same time; and hence it is difficult to define the precise agency of the *mone-sia*; and the same remark applies to the *secale cornutum*, and to internal styptics in general.

The diet, in every form of menorrhagia, must be regulated according to the attendant symptoms. If plethora exist in the intervals, it must be restricted: if, on the other hand, anæmia predominate, the diet may be more generous, and it may be advisable to allow easily digested animal food, with the view of supplying a larger amount of solid materials to the fluid of the circulation. With the same view, not much fluid should be allowed for common drink. Where the quantity of blood in the vessels is diminished, watery fluids readily pass through the parietes of the vessels, and make up the quantity of blood, but it is blood thinner than natural, and therefore itself adapted for more ready transudation. The great object, in these cases, is—by diet and by medicine—to add to the spissitude of the blood, and to improve the nutrition of the parietes of the vessels, as well as of every organ of the body.

Where the menorrhagia is connected with organic disease of the uterus, this will have to be diagnosticated by appropriate examination, and the patient be put upon a treatment adapted for its removal. The hemorrhage, in such case, is accidental or symptomatic; but still it may be palliated by the horizontal posture; great mental and corporeal quietude, the use of opiates, of astringent injections, and the tampon, when the discharge is excessive.

2. NEURALGIA OF THE UTERUS.

SYNON. Hysteralgia, Irritable uterus; *Fr.* Névralgie de l'utérus; *Ger.* Gebärmutter-schmerz.

It is generally admitted, that the attention of practitioners was

first directed to this affection by Dr. Gooch. It is one of extreme suffering, at times, and gives rise to much anxious attention; both on the part of the patient and the practitioner.

Diagnosis.—The patient complains of pain in the loins, and round the brim of the pelvis, which is constant, but liable to aggravation, especially after mental excitement, or, indeed, excitement of any kind. The paroxysms may come on at any time; but, most frequently, perhaps, they are observed a few days prior to, or after, menstruation, the recurrence of which is commonly unmodified, until the disease has continued for some time, and injuriously affected the whole organism. Sooner or later, this is apt to be the result, for the suffering is so great as to compel the patient to assume the horizontal posture, which is always, or almost always, found to afford relief.

During the greatest anguish, the pulse is usually unaffected, and this is one of the distinguishing characters of the disease,—chronic metritis always exhibiting more or less morbid activity of the circulatory movements.

If an examination be made *per vaginam*, great pain is experienced on the slightest pressure, which continues for some time afterwards, so that the patient dreads a repetition of the exploration. At times, in such cases, no abnormal condition of the os or cervix uteri can be detected; but, at others, the cervix uteri is puffy and swollen, so that, under the great suffering, the practitioner is apt to believe that there is serious organic disease of the uterus.

Causes.—These are not always appreciable. Those assigned to it are—bodily exertion when the uterus is in an irritable and excited state, as during menstruation; using too much exertion soon after abortion or delivery; mechanical and other injuries to the uterus, as from excessive coition, or the employment of astringent injections. It would appear, likewise, to have been caused by great fatigue, from dancing, late hours, long carriage journeys, &c. (*Gooch, Churchill, Ferguson.*)

They, who are most subject to the disease, are the young and middle aged,—the aged being rarely or never attacked.

The disease never, perhaps, destroys life; but the long confinement and suffering may make serious inroads in the health. The author has, frequently, however, seen patients, who have not been able to leave the couch for months and even years, and yet retain all the appearance of full health. The disease is always exceedingly tedious, but, after having continued for years, occasionally terminates suddenly in health, to the surprise of every one. The powerful mental revulsion, induced by the animal magnetizer, and by kindred arts, has occasionally effected a cure in a manner, that has been esteemed almost miraculous. The author attended a case, which had confined the patient to bed for years; she was persuaded to subject herself to protracted worship at a certain period and to prescribed ceremonies, suggested by Prince Hohenlohe; after which she found herself able to leave her bed.

Treatment.—The disease being essentially a neuralgia of the uterus, the treatment will have to resemble that of neuralgia in general. The violence of the pain must be allayed by the narcotics advised under Neuralgia; and counter-irritation be practised by means of small blisters to the loins, or by dry cupping; an opium or belladonna plaster may, likewise, be applied to the lumbar or sacral region. Warm injections, as the infusion of the slippery elm, or of benne, or of the decoction of poppy heads, may be thrown into the vagina or rectum two or three times a day. The bowels must be kept open, but only the mildest means should be used for this purpose, as the irritation may be propagated by continuous sympathy to the uterus, and the suffering be thus augmented.

In many cases, rigorous confinement to the horizontal posture is indispensable; but this should not prevent the patient from being carried into the open air, and from enjoying the revulsion, which carriage exercise is capable of affording. "A generous diet, but so as not to burthen the stomach, fresh air, a gradual and sustained course of steel, and narcotics locally applied, are the best means of attacking this capricious and obstinate disorder. The worst are low diet, the constant supine posture, close confinement and depletions, whether by purgatives or by bleeding. With the former, the malady will be subdued or will subside; with the latter, the health, and even the life of the patient are endangered." (*Ferguson.*)

Dr. Ferguson has alluded to a painful state of the vagina, analogous to the affection of the uterus just described; and which might be termed *Neuralgia of the Vagina*. Of this, the author has seen a few instances. It is characterized by excessive tenderness, when the lining membrane is touched by the finger, or the male organ; hence, sexual intercourse cannot be indulged; or if it be, it may give occasion to an attack of hysteria. Yet examination of the membrane may exhibit no variation from the healthy state.

All the patients, seen by Dr. Ferguson, were married, and of extreme nervous susceptibility. Those that have fallen under the author's care were married; but, in their general impressibility, there was nothing remarkable. In some, the painful condition is said to have supervened on the birth of a first child, and the patients never conceived afterwards; in others, it would seem to have been developed by marriage, and was not removed by repeated childbirths. (*Ferguson.*)

The treatment is essentially that adapted for neuralgia of the uterus; but the affection is apt to resist every effort, so that the patient is compelled to endure it through life; and to avoid those exciting influences, which she knows to develop suffering.

III. DISEASES OF THE OVARIES.

The diseases of the ovaries, that are most important to the therapist, are inflammation and dropsy,—the latter of which is of most frequent occurrence: both will demand some consideration.

1. *Inflammation of the Ovary.*

SYNON. Ovaritis, Ooritis, Oophoritis, Inflammatio ovarii; *Fr.* Ovarite, Inflammation de l'ovaire; *Ger.* Entzündung der Eierstöcke, Eierstocksentzündung.

Inflammation of the ovary may occur both in the acute and chronic form, but it is not often met with except as an accompaniment of peritonitis or metritis, and, in such case, it generally succeeds to abortion or delivery: it is rarely, perhaps, witnessed in the unimpregnated female. It may occur, however, independently of any inflammatory affection of the surrounding textures. (*Portal, D. Davis.*)

Diagnosis.—When acute inflammation of the ovary is accompanied by metritis or peritonitis, it may be difficult—if not impracticable—to detect the ovarian phlegmasia. When the ovary is affected alone, burning pain will be experienced deep in the region of the pelvis, in which it is situated, accompanied by the ordinary general symptoms that appertain to acute inflammation of the internal viscera. Usually, however, the constitutional affection is not severe.

Even if the inflammation should commence in the ovary, it is rarely, perhaps, restricted to that organ, but spreads to the peritoneum; and, under such circumstances, the tenderness on pressure may be more marked, and the pain may shoot to the corresponding groin and thigh.

Not much information can be obtained by examination *per vaginam*. A recent writer, however, speaks of having detected the ovarian tumour—owing to its sinking down—by the finger, in the vagina. (*Leroy d'Etiolles.*) The finger, passed into the rectum, can reach the situation of the ovary, and may discover any tumefaction of the organ, or unusual tenderness on pressure. (*Löwenhardt.*) Pain is, likewise, experienced by the pressure of the distended rectum, during the act of defecation.

In the chronic form of ovaritis, the local phenomena are of the same character as in the acute, but less in degree; and they must be diagnosticated by the same mode of exploration. The disease is, however, necessarily more obscure.

Inflammation of the ovary, both acute and chronic, may terminate by resolution, by tumefaction and induration, or softening, by suppuration, the formation of serous cysts, fibrous tumours, &c. &c.: and when both ovaries are affected, the menstrual function is interfered with,—generally, indeed, suspended,—and sterility is a common consequence of the ovarian changes.

Pathological characters.—On the dissection of those who have died whilst affected with acute ovaritis, the organ is found to present the ordinary appearances of inflammation,—as injection, and tumefaction with softening. Serous effusion occurs early into the structure of the organ, and is not unfrequently found mixed with pus. Coagulable lymph may, likewise, be thrown out at the peritoneal surface of the ovary, and adventitious union be formed with various parts in the vicinity. This is especially the case in the chronic

form of the disease. The author has seen an instance in which the fimbriated extremity of the Fallopian tube was adherent to the serous covering of the ovary. Where suppuration had taken place, the pus has been found collected in various small abscesses, and, at times, a communication has been formed between them and the bladder or rectum, so that the matter has been evacuated by those outlets.

Chronic inflammation may be the cause of various organic diseases of the ovaries, by developing a condition of the system and of the vessels of the part, which may lay the foundation for the nutritive irritation that results in the formation of heterologous productions.

Causes.—Inflammation of the ovary would seem to have been most frequently induced by sudden suppression of the catamenia, or by irregular exposure during the menstrual period. Most frequently, however, it follows labour, and has often been observed amongst the morbid appearances in puerperal fever. It has been affirmed, that females, affected with gonorrhœa, are liable to it, in the same manner as males, affected with the same disease, are liable to orchitis; a recent writer, however, (*Simpson*,) states, that he has watched diligently for its occurrence in some hundreds of cases of gonorrhœa, that have been under his care in the Lock Hospital, of Edinburgh, but that he has only met with one, and that a doubtful instance of it.

In two recorded cases, the disease supervened on the use of uterine injections. The injections were sent with moderate force into the uterus by the aid of a gum elastic sound. In one, the quantity of infusion of marsh mallows was ten drachms; and in both cases, the liquid had scarcely reached the cavity of the uterus, before the patients complained of acute pain in one side. (*Leroy d'Etiolles*.)

Treatment.—This differs in no respect from that which is adapted for inflammation of the uterus.

2. Dropsy of the Ovary.

SYNON. Hydrops ovarii, Ascites ovarii, Ascites saccatus, Hydrovarion, Encysted dropsy of the ovary; *Fr.* Hydropisie de l'ovaire, Kystes de l'ovaire; *Ger.* Wassersucht der Eierstöcke.

The ovaries are liable to various diseased conditions;—some of them exhibiting strange anomalies in the function of nutrition. Tumours of different kinds have been found originating in them, and in the interior of these, fat, fluids of various character, and even hair! Perhaps the most common affection is the one under consideration, in which an accumulation of fluid takes place in one or more cysts,—the ovaries themselves being more or less diseased in other respects, and forming, at times, fibro-scirrhous tumours of an enormous size.

Diagnosis.—The symptoms of encysted dropsy of the ovary are generally sufficiently clear; but, at times, the diagnosis is

difficult. Instead of the fluid—as in dropsy of the peritoneum—being spread equally over the abdomen, the tumour appears as if formed by a fluid contained in a sac, and commonly it is unequal, in consequence of solid matter being deposited in connection with it. In cases of unilocular dropsy, or in other words, in those in which the fluid accumulates in a single cyst, this last condition may not be apparent; but when it is multilocular, or consists of many cysts, the solid septa are often distinctly perceptible through the abdominal parietes. The fluid, which is contained in these cysts, is generally very different from that of ascites,—being, at times, watery, but generally viscid; and hence the name “dropsy of the ovary,” as applied to these cases, has been objected to. (*Burns.*)

Similar tumours sometimes form, which are connected with the uterus, and are, occasionally, of a very considerable size. These are usually considered to be ovarian, until dissection reveals their true character. A case of the kind fell under the author's care in the Philadelphia Hospital, and died under that of the author's successor in the wards, (*Pennock*, of Philadelphia,) who has well described it. The tumours measured three feet in the vertical direction, and four feet eight around, at the umbilicus; and in them were found several gallons of fetid, yellow, brown, thick and viscid fluid. These tumours were connected with the uterus, but not with the ovary.

Many similar tumours have been described by recent observers, some of which gave rise to equal difficulty of diagnosis. (*Barlow*, *Bright*, *Professor Bedford*, of New York.)

The disease may attack both ovaries, and, in such case, the catamenia may be arrested; but ordinary ovarian dropsy is not inconsistent with the existence of menstruation. (*Bright.*) As a general rule, the tumour is first felt in one groin or in both, according as one or both of the ovaries may be implicated, whence it gradually spreads upwards, as the fluid augments in the sac or sacs.

The disease generally proves fatal sooner or later; but many females bear about ovarian tumours and encysted dropsy of the ovary for years. After the disease has undergone a certain degree of development, the morbid process is arrested, and this is the most fortunate result that can be expected. It rarely, if ever, happens, that the morbid depositions are removed by absorption.

It need scarcely be said, that the functions of the bladder and rectum may be interfered with by the pressure of the tumour; and in all cases, exploration of the vagina or rectum may throw some light on the nature of the affection in the early stages.

In rare cases of ovarian dropsy, the disease would appear to have terminated by absorption of the fluid. At other times, adhesion takes place between the ovary and the intestines, bladder, vagina or rectum, into which the cyst may open, and the fluid be discharged; or the patient may die of ovaritis before or after tapping; or, lastly, the parietes of the cyst may give way, and the

fluid be discharged into the cavity of the peritoneum and induce fatal peritonitis.

Causes.—Of the causes of dropsy of the ovary we know nothing. It would seem that no age is exempt from it; but it is most frequently seen about the period of the cessation of the menstrual function.

Treatment.—It is a general opinion with therapeutists, that no plan of internal treatment is of any advantage in this disease. The cysts are there, and it appears to be a hopeless task to endeavour to remove them; granting even that it were possible, by internal means, to remove the fluid from them. (*Ferguson.*)

In the very early stages, especially if there be any inflammatory complication, general or local blood-letting may be needed;—but when such complication does not exist, and the dropsy is fully formed, the agents that are calculated to afford benefit, are those recommended under Dropsy of the peritoneum,—diuretics, cathartics, methodical compression of the abdomen, &c.

Should impediments exist to the evacuation of the bladder, they may be obviated, at times, by pushing upwards the impacted portion of the tumour above the brim of the pelvis. (*Ferguson, Churchill.*)

When the fluid collection has attained such a size, that it interferes mechanically with the action of any of the vital organs, it is important to remove it by paracentesis. This is, however, only a palliative measure. Rare cases are on record, in which it would seem to have succeeded radically; but this result is not to be expected. It is in these encysted dropsies, that the astonishing quantities of fluid are discharged, which have been recorded; for there is less suffering and danger from the operation in encysted dropsy, than in ordinary ascites. It is best performed, perhaps, by the common lancet, and the female catheter; but where the fluid is tenacious, it may not flow through the eyes of the instrument, and the trocar may be necessary.

It has been suggested, that a stimulating fluid should be thrown into the sac after the removal of the dropsical accumulation; but this must necessarily be a hazardous procedure. The same may be said of incisions made into the diseased ovary through the abdominal parietes, so as to form an external fistula communicating with the cavity of the tumour, through which the fluid may be discharged.

Lastly, It has been proposed to completely remove the diseased ovary, either by opening the abdomen freely, and extirpating the tumour in its entire state; or by making a smaller incision through the abdominal parietes; evacuating the tumour by tapping, and immediately afterwards drawing it out, in its empty and collapsed state, and cutting it off as near the root as possible.

But all these are formidable operations, and although success has followed them in some cases, they ought not to be had recourse to except under extraordinary circumstances, and after the most mature deliberation.

BOOK IX.

DISEASES INVOLVING VARIOUS ORGANS.

THERE is a large class of diseases, and these of a most important and interesting character, which it is difficult—if not impossible—to trace to any particular organ; and in which the mischief invades different organs and apparatuses. It appears, however, to be so difficult to conceive that a morbid agency can impress different parts of the economy at the same time, so as to induce a general disturbance of functions simultaneously, that the fact of a general disease has been denied, and it has been maintained that, in such cases, a pathological condition first arises in some organ or tissue, whence the disease spreads, by sympathy, to other parts, until, ultimately the whole organism becomes invaded.

Unquestionably, in the generality of instances—if not all—the morbid impression must be made upon a part of the economy, in the first place,—upon the surface with which it comes in contact, and whose vital properties it must affect; yet it is difficult to conceive, that the surface is in all cases rendered organically morbid; its functional phenomena may, indeed, be so slightly modified, as not to be indicated by any perceptible symptom; and the induced disease may be first manifested by disorder in one or more of the functions of innervation, circulation or secretion. A good example of this occurs in a disease, the progress of which we are enabled to trace from the first application of the morbid agent,—smallpox, produced by inoculation. When the virus has been introduced under the cuticle of the arm, or of any part of the body, so that it comes in contact with the blood-vessels, it is absorbed into the circulation; yet, for a period, which is nearly identical in all cases, the cause appears to exert no functional phenomena, until ultimately a general rigor indicates the disturbance, which has been induced in the organism. In this case, it is impossible to pronounce as to the part of the system first impressed: the symptoms would lead us to infer the nervous system; but probably careful examination would indicate simultaneous, if not precedent, disorder of the circulatory or secretory functions, or both, after which the disease becomes manifested by the supervention of rigors or other decidedly morbid phenomena.

CHAPTER I.

F E V E R .

SYNON. Febris, Pyretos, Pyr, Pyrexia; *Fr.* Fièvre; *Ger.* Fieber.

THE subject of fever has given rise to as much difference of sentiment as that of inflammation; and, perhaps, we may add, to as much useless speculation. Definitions are proverbially difficult, and there is none, on which pathologists have differed more widely than on that of the morbid derangement now under consideration. A recent writer (*Christison*) thinks, that no better definition can probably be found, than the following, which is a modification of that sanctioned by Cullen:—"After a preliminary stage of languor, weakness, and defective appetite—acceleration of the pulse, increased heat, great debility of the limbs, and disturbance of most of the functions, without primary local disease." He properly remarks, however, that it is a singular instance of the extreme difficulty of arriving at correct nosographical definitions, that scarcely any one of the characters here assigned is absolutely invariable; and he adds, "nor is it likely that any other definition will be found, which is not subject to the same defect."

It is obvious, that the last member of the definition involves an admission, which is by no means sanctioned by a number of the pathologists of the present day, and which was largely combated a few years ago, under the influence of the captivating doctrines of Broussais. A recent writer (*Rostan*) has, indeed, boldly affirmed, that the class of continued fevers can no longer be preserved, and that they should disappear from every philosophical classification. "These diseases," he remarks, "are but visceral phlegmasiæ, presenting symptomatic varieties. Some are simple phlegmasiæ; others have a special character: amongst the first, we place inflammatory fever, which is nothing more than a gastro-intestinal, or other phlegmasia; little marked locally, but producing very intense sympathetic general symptoms, and manifesting itself in sanguine and plethoric individuals. Perhaps, in some cases, much more unfrequent than has been presumed recently, the circulatory system, and principally the aorta, the heart, and the large vessels are the seat of the irritation; but the cases, adduced in support of this opinion, have not appeared to us to be entirely conclusive. It is unquestionable to every unprejudiced mind, that the bilious, or meningo-gastric fever of authors, is nothing more than simple gastro-enteritis, occurring in an individual endowed with a predominance of the digestive system."

"Mucous or adeno-meningeal fever is, certainly, also, an inflammation of the greater part of the mucous membranes, supervening in particular localities, and in individuals of an atonic tempera-

ment. Dothinenteritis, also, appears to be nothing more than the mucous fever of authors, presenting, in this case, a special character. The same phlegmasia may assume the form of the putrid or adynamic fever. But this adynamic form, this prostration of the powers, may accompany every intestinal, thoracic, encephalic and other phlegmasia. This fever is but one of the forms of these different inflammations, and not of gastro-enteritis exclusively. Is it the fact—as has been recently stated—that the blood is in a state of putridity in this pretended fever? Although we may admit an incontestable alteration of the fluids, it appears to me necessary to wait for further observations, before we can pronounce on so grave a subject. The experiments of MM. Gaspard, Magendie, Leuret, and others, render this opinion, however, very probable. Malignant ataxic fever presents, too evidently, the symptoms of meningitis, to render their identity a matter of dispute. It is possible, also, that these inflammations of the brain and its envelopes may be induced by a special cause, as by animal matters in a state of putrefaction, &c. Under such circumstances, they doubtless have a special character, which entrains the greatest danger, and requires a special treatment.

“It is scarcely necessary to repeat, that slow hectic fevers, are nothing more than fevers that are symptomatic of chronic phlegmasiæ of different viscera.”

These are the views of one, who is a strenuous maintainer of the local seat of fever in the first instance. In this he is supported by many distinguished members of the profession in his own country, most of whom, however, differ as to the precise part of the economy to which the primary mischief ought to be referred. One of the most recent pathological writers on the subject, (*Bouillaud*), affirms, that fever is an affection symptomatic of irritation, or of general inflammation of the circulatory system; inflammatory fever is one of the degrees only of this irritative or inflammatory state; and the other forms of supposed primary fever are mere complications, arising, sometimes, from inflammation of the mucous membrane of the alimentary canal and its follicles. Yet, there are others, who appear to us to be more correct in their deductions, and who, in their definitions of fever, cautiously avoid committing themselves on the question of local lesion. Thus, one of the most modern writers, (*Dubois d'Amiens*), considers, that “fever expresses a state, in which are observed,—variations in animal heat, acceleration of the pulse, and general disorder of the functions, with or without local lesion.”

Perhaps, on this question, as on many others—where due care has not been taken—the researches of the pathological anatomist have induced error. It is not always easy, even with careful observers, to distinguish between the hyperæmic condition which is the result of inflammation, and that which may be termed cadaveric. Simple hyperæmia of vessels, without organic change in a part, should always be viewed with caution, and is very rarely a

pathological state—never, perhaps, sufficient to account for a protracted disease like continued fever. Yet, at a time, when it was fashionable to consider all fevers to be gastroenteritis, simple or complicated, (*Broussais*,) hyperæmia of the gastroenteric mucous membrane, observable on dissection, was found all-sufficient to account for the phenomena!

But even were we to admit, with the followers of Broussais, that fever is originally seated in the lining membrane of the stomach and bowels, or, with those of Clutterbuck, that it is in the encephalon, the difficulty would arise, when evidences of these morbid conditions are found on dissection, to determine, whether these constitute a primary lesion, or are the result of morbid conditions occurring in the course of the disease.

Pathological anatomy—with heedless, or too enthusiastic observers—has too often been invoked to establish the former of these positions; but, at the present day, the general belief is, that these lesions are less the evidences of primary local disease, than of pathological conditions, which have supervened in the course of the disease. Such is the view which the author has always been led to adopt. As in the case of every other disease, not induced by any mechanical cause, the first impression must be made on the contractility or vital properties of the part with which a morbid agent comes in contact; the functions of nutrition of the part are modified; and, through the extensive correspondence which exists between every part of the organism, through the nerves and otherwise, parts at a distance become implicated. Of the extent of this consent between different parts of the organism, both in its therapeutical and pathological relations, the author has had frequent occasion to speak both in the present work and elsewhere. (*General Therapeutics*, p. 464: Philada. 1836.) “In the healthy state of the frame, it is evinced by the morbid influence of cold and moisture, when applied even to a small portion of the cutaneous surface, which has been previously shielded from their action. If a healthy person exposes his feet to these agencies, the capillary function becomes modified, and there is not a part of the capillary system, which does not feel the effects; but disease is not induced in the whole, unless it is, at the time, predisposed to assume the morbid condition. Generally, it happens, that there is some portion of the capillaries more disposed, at the time, to take on a diseased state than another, and, under the irradiations that occur, owing to the modified action of the capillaries of the feet, disease in some organ results. A similar action takes place when we apply cold and moisture therapeutically. This we do in febrile affections, whenever the skin is steadily hot and dry; and we find, that it is not necessary, that these agents should be applied over the whole of the cutaneous surface: it is but requisite, that they should be applied over a comparatively small portion, as over the hands and arms. The sedative influence of the cold is exerted upon the capillaries, with which it is made to come in contact; the function of

calorification has its activity diminished, and, soon afterwards, we discover, that the heat of the whole system has been manifestly lowered by the topical application."

And, again, (*Ibid.* p. 481,) "In the case of smallpox inoculation, we insert a minute portion of variolous matter under the cuticle, bring it in contact, in other words, with the corpus papillare, and with the divided vessels of that body,—and we can predict, that, in a proper subject, a fever will break out in a certain number of days after inoculation, and that, after a definite period, an eruption will make its appearance, which will go through its regular stages of increment, maturation and declension, leaving the patient, after a time,—which, in favourable cases, equally admits of prognostication—perfectly well. It is assuredly not easy to conceive how this extensive secretion of morbid poison can take place, without presuming, that the action of the capillaries has become modified by the condition of the fluid circulating in them; and that this fluid has had its condition changed by the reception into it of the variolous matter. Still, although we admit this, there is much to be explained, both as regards the exanthematous fevers, and those that are unaccompanied by any cutaneous affection.

In the case, which I have assumed, the smallpox taint must evidently have been received into the blood, and, by the action of the fluid on the capillaries, and on the nerves distributed to them, the exanthematous fever resulted. In other cases, the capillaries, and the nerves connected with them, may be first morbidly impressed, and, successively, the condition of the circulating fluid may be modified. Of this we have examples in all the active hyperæmiæ, and in every febrile irritation, which is the consequence of derangement in any portion of the capillary system of vessels. In one or other of these modes, all fevers—miasmatic or common—are probably induced."

The changes observed in the blood, in certain fevers—as in the yellow fever of the West Indies—it has been maintained, (*Stevens*), are the cause of these diseases; but the same remarks that were made on the local seat of fever are applicable here. The changes in question supervene in the course of the affection, and are probably rather the results of the febrile condition. In different inflammatory fevers, marked changes are perceptible in the character of the circulating fluid, but no one considers that they are the first link in the febrile chain. It is, indeed, impossible to fix, with any thing like precision, as has been attempted, (*Southwood Smith*), the exact sequence of the disorder of innervation, circulation, and secretion. Generally, some signs exist, which are more especially referable to the first of these, such as languor, lassitude, and the *malaise*, that immediately precedes and accompanies the rigor, or chill, where such exists; but if we were to examine closely, and with full understanding, we might discover some derangement about the circulatory and secretory organs,—some variation in the strength or frequency of the heart's action, or in the tension of the

arteries; or some appearances about the mucous membrane investing the tongue; unusual dryness of skin, and modification in the state of the fluid secretions. We certainly are justified in affirming, that all these functions are more or less modified in every case of protracted fever; but we may still remain in doubt as to which first becomes materially deranged.

The classification of fevers, adopted by different individuals, has been various. By those who admit the division of febrile affections into the *idiopathic* and the *symptomatic*,—or into those which are not induced by any known local affection, and those which are secondary—and who have attempted to range every febrile disease under one or other of these heads,—the latter class has been multiplied, in many cases, almost *ad infinitum*. Hence the numerous divisions of fever contained in the works of the German and French pathologists more especially.

The primary fevers, which are those to be considered here, may be divided, for convenience of study, into five great classes;—the *intermittent*, the *remittent*, the *continued*, the *eruptive*, and the *arthritic*, each of which will demand a separate investigation.

SECTION I.

INTERMITTENT FEVER.

SYNON. Febris intermittens, Dialeipyra, Anetus, Intermittens, Ague, Ague and Fever; *Fr.* Fièvre intermittente, F. d'accès; *Ger.* Wechselfieber, Kalte Fieber, Aussetzende Fieber.

An intermittent, being the most simple form of fever, falls judiciously, perhaps, under consideration first. It consists, in its simple state, of three distinct stages,—a cold stage, followed by a hot, and this, again, by a sweating stage: the morbid phenomena then wholly, or mainly, disappear, to be reproduced at an interval not always the same. The three stages constitute a *paroxysm* or *fit*; and the interval, between the cessation of one paroxysm and the commencement of the next, is termed the *apyrexia* or *intermission*. The different periods at which they recur, constitute the *type* of the intermittent.

When the paroxysms return every day, the intermittent is *quotidian*; if every other day, *tertian*; if the interval be a day longer, *quartan*; and these are the chief types observed. The *double quotidian* has two paroxysms in the day; the first corresponding with the first on the following day, and the second with the second. The *double tertian* has daily paroxysms,—the paroxysms of each day corresponding with others forty-eight hours afterwards. *Double quartans* are sometimes seen, which have a paroxysm on two consecutive days, and an intermission on the third. If a tertian has two paroxysms every other day, and one only on the intercalary day, the fever is said to be *triple*. If there be two paroxysms a day, obeying the laws of the tertian type, the fever is said to be

a *quadruple tertian*. In like manner, *double* and *triple quotidians* have been admitted; and authors have gone so far in their divisions as to admit *quintan*, *sextan*, *hebdomadal*, *octan*, *nonan*, *decimal*, *mensual*, *bimensual*, *trimensual*, and even *annual* intermittents! It is scarcely necessary to say, that the evidence of such connection between the paroxysms, as authorizes their being regarded as a part of the same disease, must be extremely loose and unsatisfactory, and that, perhaps, in all,—certainly, we think, in the annual intermittents—the *morbi anniversarii*—there must have been a fresh exposure to the exciting cause, and a fresh production of a disease similar to its precursor, but not identical with it.

Various epithets have, likewise, been applied to intermittents, some of which are used in the medical language of the day, and, therefore, require explanation. If the paroxysms of an intermittent have nothing fixed in their periods of recurrence, they are said to be *irregular* or *erratic*; if they exhibit anything unusual in their stages, they are termed *anomalous*; for example, should one or more of the paroxysms be wanting, or their order be modified;—and should the stages of the paroxysm be wholly wanting, and in their place some other morbid phenomenon present itself, which recurs according to a particular type, the fever is said to be masked,—constituting the *febris intermittens larvata* of authors, and the *masked* or *dumb ague* of the unprofessional.

Again, if the paroxysms of the double quotidian or tertian, or of the triple quartan, approach each other so closely that one begins before its precursor terminates, the fever is said to be *subintrant*; if the succeeding paroxysm comes on before its usual hour, the disease is said to be *anticipating*; and, on the other hand, if it does not appear until later than usual, it is said to be a *postponing* quotidian, tertian, &c., as the case may be.

Diagnosis.—Before the cold stage of a paroxysm of an intermittent sets in, the patient is usually warned of its approach by a series of prodromic or premonitory symptoms. These usually consist in more or less general indisposition, lassitude, pains in the joints or limbs, blueness of the nails, and uneasy sensation in the extreme parts of the body—*acrodynia*. These do not usually exist long before the symptoms of—

1. The *cold stage* present themselves. At first, a sensation of cold is experienced, which may be accompanied, or not, with shivering or rigors. It may be general, or, first of all, limited to the hands or feet; or a sensation may be experienced as if cold water were trickling down the back. The skin becomes pale, yellowish, or purple in spots; and when the sense of cold is excessive, there is the *cutis anserina*, *chair de poule* or *gooseskin*, produced by the prominence of the bulbs of the hair, owing to the recession of the fluid from the cutaneous surface surrounding them.

The attitude of the patient is similar to that assumed when suffering from ordinary cold. He lies or sits, as it were, in a heap, crowded upon himself, the limbs and jaws shaking, and the teeth chattering; the voice is enfeebled and tremulous; the inspiration

embarrassed; the pulse is small; and the sensible perspiration suspended: the skin feels cold to the observer, but still the coldness is by no means proportionate to the sensations of the patient; at times, indeed, when he is suffering intensely, there may seem, to the hand of the practitioner, to be but a slight diminution of temperature. The general temperature of the body is usually but little affected, and the author has noted it, occasionally, under the tongue, somewhat above the natural standard.

The urinary secretion differs materially in the different stages; in this stage, it is commonly clear and copious.

There is frequently, also, more or less derangement of stomach, nausea, or vomiting; and, occasionally, considerable pain is experienced in the region of that viscus.

The duration of the cold stage is very various: at times, it lasts only a few minutes; at others, half an hour or an hour; and, in rare cases, it may continue for four or five hours. In the very worst forms, indeed, of pernicious intermittents, to which the name *febres algidæ* has been given by many writers, the reaction is never re-established, and the patient dies in this, the first stage or *stadium* of the paroxysm.

To the stage of cold or of *concentration*—as it has been termed—succeeds,—

2. The *hot stage* or *stage of expansion*; the phenomena of the cold stage appearing to take place from the circumference towards the centre of the organism, whilst those of the hot stage, commence within, and *expand* themselves, as it were, towards the circumference. (*Dubois d'Amiens.*) The heat commences at the epigastrium, whence it spreads to the head, and the extremities. The phenomena of the cold stage gradually disappear; the hue of the skin, from being pale, becomes flushed; the thirst is great; the pulse developed, and augmented in frequency; the breathing free, but hurried as in other forms of fever; the mouth dry and clammy; the breath and skin hot; and the urine high-coloured.

The degree of heat or of the sensation of heat is very variable. At times, it is merely agreeable; but, at others, it is so insupportable as to induce great restlessness, and change of position, in order that the body may be placed in contact with a cool surface. In this stage, the epigastric uneasiness commonly yields to cephalalgia, which is occasionally intense.

3. The sweating stage or stage of *termination* succeeds. The sweating commonly begins about the head, and afterwards on the upper part of the chest, the back, and the inner part of the thighs; and soon becomes general. Its amount is very various. At times, it constitutes merely a gentle moisture, whilst, at others, it is so profuse as to soak the body linen, and even the bed. Its smell is sour, or sweetish. The moment the sweating stage becomes established, marked relief is experienced: the pains disappear; the uneasy feelings of every kind are mitigated; the increased heat subsides; the pulse becomes full and free; and the urine now deposits a lateritious or brick-dust sediment.

The sweating stage does not usually continue longer than three or four hours.

Such are the stages which constitute a paroxysm of an intermittent. The patient feels entirely restored, with the exception of a sensation of fatigue or debility. The stage of apyrexia or intermission now commences, during which all the morbid phenomena cease, or excite so little attention, that the patient regards himself well. Still, unless cured, he has the disease within him, and must be considered to labour under intermittent fever, until the tendency to periodical recurrence has been obliterated.

The period of the day, at which the paroxysms of the different types of intermittents occur, is by no means the same. In the quotidian, for example, they generally appear in the morning; in the tertian, about noon; and in the quartan, after dinner. So commonly, indeed, are these periods regularly observed, that they have been made to enter into the definition of the different forms.

The same may be said of the duration of the paroxysms, which, in the quotidian, is usually under eighteen hours; in the tertian, under twelve; and, in the quartan, under nine.

In the quotidian, the cold stage is usually short; and in the quartan, long. The tertian holds the medium place in this respect. It is, moreover, the most manageable form; and the quartan the least so.

The duration of the disease is unlimited. At times, it terminates in the course of a few days; whilst, at others, it continues for months, and even years; but, if properly managed, it may almost always be cured by appropriate treatment. So much is this the case, that in some of the aguish districts of this country, in which simple intermittent prevails, the disease is commonly treated without the assistance of the physician; and the circumstance of an individual, summoned on a jury, having intermittent, is not always considered a sufficient reason why he should not attend.

If, however, the disease be suffered to go on, or if it recurs repeatedly, the functions of hæmatisation and nutrition always suffer; the complexion becomes sallow; the different organic actions are imperfectly accomplished; the spleen, and, at times, the liver becomes hypertrophied, so as to form the tumors that are known, in aguish districts, under the name of *ague-cakes*; (see vol. i. p. 555); the limbs become œdematous; and the nutrition of the body falls off. It has, indeed, appeared to the author, that, in all cases of intermittents, which have recurred for a few times, the spleen is more or less engorged so as to be felt distinctly beneath the false ribs, and that more or less effusion is perceptible, if careful pressure be made on the instep. Yet these consequences or concomitants of the intermittent disappear with the disease. The former—as elsewhere remarked—encourages the idea, that the spleen may serve as a diverticulum for the blood during the cold stage; and the latter indicates, that under the disturbance of the circulatory functions, during the paroxysm, there is a loss of balance between those

vessels whose office it is to deposit and those whose office it is to take up, so that the action of the former preponderates. The dropsy or œdema is, in other words, the result of functional derangement, and, therefore, one of the most manageable forms of hydropic disease. Where the enlargement of the spleen or liver is to such an extent as to interfere with the ready circulation of blood through those viscera, a dropsy of another form may arise from mechanical hyperæmia, which is of a more serious nature than the first mentioned, and the prognosis of which merges in that of the organic affection on which it is dependent. The dropsy, here again is but secondary or a symptom, as it perhaps almost always is.

It fortunately happens, that our intermittents are, generally, of the simple character described above; but, in some countries, and in certain parts of the United States, and occasionally in districts, where simple intermittents prevail almost exclusively, a rapidly fatal form of the disease is seen, which destroys in the first paroxysms, if the physician should not succeed in arresting it. To this form of intermittent, the epithet *pernicious* or *congestive* has been applied by many—indeed by most—writers. The chief functional phenomena, by which this form of intermittents is characterized, are—a greater degree of severity of all the symptoms,—generally, a much longer cold stage, and feebleness of reaction in the second stage; with symptoms denoting a serious implication of important organs;—for example, loss of sensation and motion; involuntary discharges from the bladder and bowels; great change in the facial expression; prostration; languid, scarcely perceptible, circulation; and more or less irregularity of the heart's action. At each subsequent paroxysm, these alarming symptoms augment; and the apyrexia, instead of being one of comparative health, is imperfect, and attended with languor, stupor, and other signs of serious indisposition.

In the paroxysms of these pernicious intermittents, there is usually some concentration of the vital activity, or enfeebled action, giving rise to hyperæmia in some internal organ; and those nosologists, who are fond of subdivisions, that may contain every variety of diseased action, have assigned different names for these various forms; hence, we read of *choleric*, *dysenteric*, *hepatic*, *cardialgic*, *peripneumonic*, *pleuritic*, *nephritic*, and *cephalalgic* pernicious intermittents, according as they are accompanied by cholera morbus, dysentery, liver disease, pain in the stomach, peripneumonia, pleurisy, nephritis, or headache; at other times, they are designated from some predominant functional phenomenon,—as the *diaphoretic*, *algid*, &c. It is obvious, however, that all these distinctions are arbitrary, and that they might be extended indefinitely. They are unnecessary, and might, with as much propriety, be applied to the simple, as to the pernicious intermittent.

Causes.—It would appear, that every age is liable to intermittents, but not in an equal degree. In highly aguish districts, we

observe young infants, even whilst at the breast, suffering under it; but it is less common at this age than perhaps at any other. The author had recently a case under his charge of a child, ten months old, in which the disease yielded to the usual antiperiodic treatment. The mother suffered at the same time, and was also cured. Both had been exposed to the morbid exhalations from one of our malarious rivers.

The disease is met with more frequently amongst males than females, because the former, from their out-door labours, are more exposed to the exciting cause; but where both sexes are equally exposed, the female is attacked at least as frequently as the male.

It is met with in all climates, but less perniciously, perhaps, in the colder regions of the globe, than in the torrid, or the temperate. In the same regions, too, it prevails more virulently in some districts than in others. When its grand exciting cause, malaria, is treated of, it will be shown, that there is something extremely capricious in the mode in which it exerts its morbid agency; sometimes exhibiting itself in the high grounds, whilst the low are exempt; and occasionally visiting tracts of country, where it had been previously unknown; whilst, on the other hand, it may leave localities, where it had been before an annual visiter.

Season, unquestionably, exerts an influence, and this mainly by its effect upon the soil or locality, that gives rise to the exhalations, which are its grand exciting cause. The latter end of summer and the autumn are, in this country, the seasons during which the disease generally prevails. It is also, occasionally, seen in spring; but is commonly so mild at this season, as to have given rise to the old saying, that,—

An ague in the spring,
Is physic for a king.

It was supposed, to act as “physic,” by expelling morbid matters, which, without its intervention, might have been the source of more serious mischief.

The great exciting cause of intermittents is, doubtless, some emanation, of whose nature we know nothing, which, under favouring circumstances, is exhaled from certain localities, and not from others. The localities, in which its effects are most observed, are so generally marshy, that the name *Marsh poison*, or *marshy miasm*, has been given to it. It does, undoubtedly, arise, however, in districts that are by no means paludal; and hence the Italian term *Malaria*, which, like *Aria cattiva*, merely means “bad air” is a preferable term, and is generally adopted, not, however, exclusively—for there is, doubtless, a malaria or bad air concerned in the production of other diseases that are endemic—as goître, beriberi, pellagra, &c. &c. Nor can this fact be lost sight of in our investigations into the nature of those emanations that give rise to intermittent fever.

The reason of the inference, that where intermittents prevail, there is something peculiar in the geology of the district, is, that in

one country or district in close proximity with another, intermittents may exist to a great extent in the former; whilst in the latter they may be wholly unknown. Districts, indeed, similar to those which in certain regions are known to disengage the marshy miasm in great abundance, may, in other regions, be perfectly salubrious. It is not every marsh that exhales the fitful pest. In the eastern parts of this country, many marshes exist, where agues are unknown; and, again, malarious diseases prevail in fearful intensity, in the most pernicious form, where there is no such thing as a marsh within many miles. Such is the case with the Maremma district in Italy, which extends from Leghorn to Terracina. The common idea is, that malaria is the product of vegetable decomposition; others, however, have added animal decomposition, others have ascribed it to animalcules; whilst others, again, have referred it to animalcular decomposition.

The various hypotheses—for they merit no loftier name—sufficiently exhibit the obscurity of the subject. Vegetable decomposition has been more constantly invoked, inasmuch as vegetable matter is almost everywhere to be met with; yet the evidence in favour of it appears to the author to be very unsatisfactory. Vegetable decomposition, it will be admitted, does not give occasion to it everywhere, for there are numerous fertile districts in which intermittents are wholly unknown. There must, consequently, be something in addition to it, if we admit that it exerts any agency. The main facts on record indicate, that where a locality is already malarious, as proved by the existence of malarious disease—for we have no other proof of it—there are certain physical conditions which may give rise to a greater disengagement of it. The steeping of hemp has generally been esteemed an unhealthy process; and so it is, where the locality is malarious, yet there are numerous examples to show, that the process is not unhealthy in districts where these diseases do not prevail. At the foot of the southwestern range of mountains in Virginia, a friend of the author cultivates the hemp largely, yet no such effects as those represented are caused by it. In many parts of that salubrious district, intermittents are wholly unknown; yet, at a few miles distance, they prevail annually. Can it be, that there is vegetable decomposition in one case and not in the other? Marshes and millponds may exist, yet the locality may be free from disease. The inhabitants of a malarious region, who have never lived in one that is not so, can neither readily comprehend nor credit this, but the fact is undoubted. A modern English writer (*Carbutt*) has adduced an example of what we often meet with both in this and other countries. It strikingly exhibits how little we know of the terrestrial conditions that generate the malaria which produces intermittent and other diseases. “I have to remark to you,” he observes, “that in the memory of the oldest medical practitioner living, and as far back as tradition can reach, there never was an ague caught in Manchester, nor within a considerable number of miles of it.

This fact is rather remarkable, as you know we lie upon four rivers, and one or two considerable brooks, besides being surrounded and traversed by canals innumerable. But, do we never see this ague then in Manchester? O, yes; we see plenty of it. The poor Irish, who go in the autumn of the year to assist at the harvest in Holderness, Lincolnshire, Cambridgeshire, Essex, and other places, come, many of them, to winter in Manchester, and the first east wind that blows in February or March, brings out the first paroxysm of that ague, which they had caught in the autumn, but which had lain undeveloped, and unsuspected, in the system until aroused by such weather as we generally have in February and March."

The author has canvassed elsewhere, (*Elements of Hygiène*, p. 149: Philad. 1835,) and at considerable length, the question as to the origin of the malaria, that gives rise to intermittent fever especially; and every fact and argument, which he has since seen, confirm him more and more in the conclusion there drawn,—“that a great and ever acting cause of the difference of salubrity in countries is seated in the locality,—that is, in the soil that forms them, and in the air that circulates above them; and although we may be able to modify the condition of the former, and improve the circulation of the latter, we can rarely succeed in annihilating either of those influences."

It is proper to remark, that such a change occasionally occurs in a malarious region, as to render it entirely healthy, and this without our being able to assign any plausible conjecture for the alteration. At times, too, after having left one of its former haunts, it may return, after the lapse of a longer or shorter period (*Sir G. Blane*). Not many years ago, the villas on the banks of the Delaware were almost uninhabitable at the latter end of summer, and in the autumnal months; but they are now healthy, whilst those on the verdant and sylvan banks of the Schuylkill suffer from malarious emanations. In all cases, in which these emanations are given off, it would seem to be necessary that there should have been a certain amount of moisture present, which has been evaporated by the solar heat from the malarious soil; hence it is, that the deltas and estuaries of rivers, swamps, and the shores of the sea and rivers, offer situations which are favourable to their disengagement. It has, indeed, been affirmed, that there seems to be one only condition indispensable to the production of the malaria or marsh poison on all surfaces capable of absorption, and that is,—the paucity of water where it has previously and recently abounded. (*Ferguson*.) “To this,” Dr. Ferguson remarks, “there is no exception in climates of high temperature, and from thence we may justly infer, that the poison is produced at a highly advanced stage of the drying process;” and he properly adds, that “in the present state of our knowledge, we can no more tell what that precise stage may be, or what that poison actually is, the development of which must be ever varying, according to circumstances

of temperature, moisture, elevation, perflation, aspect, texture and depth of soil, than we can define and describe those vapours that generate typhus fever, smallpox and other diseases."

But even in climates of high temperature, the circumstances, detailed by Dr. Ferguson, are not sufficient, of themselves, to give rise to the malaria that induces intermittent fever, inasmuch as there are many places apparently favourable to its generation, in which intermittents are unknown. The soil must itself be malarious, and then, under favourable circumstances, the morbid emanations may be abundantly exhaled.

Although unacquainted with the physical character of the marsh poison, notwithstanding the researches of many excellent chemical analysts, we are acquainted with certain of the laws by which it is governed. Although of greater specific gravity than air, it appears to be carried up during the day, along with aqueous vapour, which is lighter than air in the ratio of 625 to 1000, and during the night is deposited. It is in greatest concentration near the surface of the earth, and hence the inhabitants of the ground floor of any habitation are more exposed to its morbid agency than those who occupy the upper stories, (*Sir J. Clarke, Ferguson,*) and, accordingly, in order to ensure, as far as practicable, the salubrity of dwellings in malarious soils, they should be raised on arches, or the lower story be suffered to remain wholly uninhabited.

We can likewise comprehend, how a high wall or barricade, placed between a soil exhaling malaria and one that is not, may protect the dwellers on the latter from disease, by fencing in the emanations, and preventing them from being wafted along the surface by the winds; and how the intervention of woods may serve as a protecting screen. It has been suggested, that this may have been a reason, why the ancients consecrated the woods, in the vicinity of Rome, to Neptune, in order to secure them from the axe. In the distresses, however, in which the great expenditure of Pius VI. involved the Holy See, a large district of these woods was sold and cut, and an increase of danger was thus caused to the unprotected city. (*Sir Charles Morgan.*)

The same circumstances account for the well known fact, that whilst the inhabitants of a plain, on the level of a locality, that is exhaling malaria, may escape intermittent fever, those dwelling on neighbouring elevations may suffer extensively. A recent writer (*Shapter*) remarks, "It is not a little singular, that during the years 1800-1802, when intermittent fever prevailed in England, while the inhabitants of the high grounds were harassed by this fever in its worst forms, those of the subjacent valleys were not affected by it." The explanation of this is, that when the heavier malaria is taken up along with watery vapour from a malarious soil, under favourable circumstances, it is wafted onwards and may be deposited on elevations under the lee of the malarious soil; but if the atmospheric circumstances should be such, that the malaria, as it escapes, is wafted along the surface, then the inhabitants of

places on a level with the source of the emanation may be affected with malarious disease rather than those on the elevations. In this country, where there are so many and such extensive surfaces exhaling this poison, these facts are often noticed.

The health of a locality is, likewise, often connected with the winds that prevail during the latter part of summer and autumn. In this country, they are chiefly from the southward, or have, what the sailors term, *southing* in them. These winds are warm, and, when from the east, are moist at the same time. Inhabitants of the northern shores of our rivers, that exhale malaria, or to the northward of any malarious locality, may, therefore, be expected to suffer more than those to the south of those localities, and such is, *cæteris paribus*, the fact.

The above are some of the main circumstances connected with malaria as an exciting cause of intermittent fever. For farther particulars, the author may refer to the work already cited.

It was remarked, that malarious emanations are, doubtless, the great exciting cause of intermittents. By many, they are regarded as the sole cause; and it is questionable, whether a true intermittent fever is ever produced, without, at least, some predisposition derived from locality; otherwise it would be difficult to account for the entire exemption of numerous localities from the disease, no matter what may have been the influences to which, in other respects, the inhabitants were exposed. Certainly, if intermittent fever ever does occur apart from malarious influence, the case must be rare; nor has the author ever had the slightest reason for entertaining the belief, that the disease is communicable from one person to another by contagion, as has been presumed by some. (*Bailly, Brown.*) It is, indeed, in all strictness, entitled to the appellation of an endemic.

Pathological characters.—Pathological investigations throw no light whatever on the essence of intermittent fever. An eminent pathologist (*Bailly*) visited Rome for the express purpose of determining, if practicable, the nature and seat of the disease; but although his opportunities were numerous, and his zeal and attention unbounded,—from the very nature of the case, they were without any determinate results. Their value was negative rather than positive. In 33 necroscopies, he found more or less disease of the brain; in 22 of these, there was thickening and other marks of inflammation of the arachnoid; and in 11, inflammation of the substance of the brain. Gastro-enteritis was observed in 20 cases. In 4, gastritis existed alone; and in 4, enteritis alone. In 11, the spleen was softened; in some instances enlarged; one weighed from two to three pounds, and another from eight to ten pounds. In two cases, the spleen was hypertrophied and indurated. In three, it was ruptured, and in one, it was gorged with blood. In two cases, the liver was softened; in four, gorged with blood; and, in one case, the gall-bladder was inflamed. In two cases, there was pericarditis; in three, peritonitis; in one, pneumonitis,

and, in one case, there was inflammation and enlargement of the parotid.

It is obvious, that these appearances throw no light on the pathology of the disease. All might, indeed, with as much propriety, be esteemed secondary, and occurring in the course of the malady. They certainly do not establish the view, so generally followed some years ago, by the followers of a celebrated systematist, (*Broussais*), who maintained, that intermittents are but gastro-enteritis. "Every regular paroxysm of an intermittent," said Broussais, "is the sign of a gastro-enteritis, the irritation of which is afterwards transferred to the cutaneous exhalents, which produces the crisis." This, it need scarcely be said, is nothing more than an assertion, and an assertion destitute of any sufficient foundation. There is, in reality, no resemblance between a paroxysm of intermittent fever, and an attack of gastro-enteritis, either in the symptoms, causes, or treatment.

The believers in the local origin of fever are embarrassed to account for the phenomena of intermittents. A recent writer, (*Rostan*), who declares, in the most positive manner, that a fever without seat cannot exist—thus expresses himself of that now under consideration:—"After the death of patients, various organic lesions are observed, which cannot, however, be regarded as the cause of the intermittent phenomena, unless, as M. Rayer has well remarked, we suppose that intermittent fever is by turns a gastritis, an enteritis, a carditis, an encephalitis, &c., which is absurd. The true organic cause of the intermittence is unknown. We are of opinion, that it is primarily seated in the fluids, in the blood, and that from thence it influences, in a special manner, the nervous system.

"For some years past, sophisms and explanations have been adduced in multitude, to prove, that the type of intermittent fevers, is but an accessory phenomenon of slight importance; that these fevers, like the continued, are but symptomatic of local phlegmasiæ occurring under a peculiar form. It is not without disgust, that we peruse these verbose collections of paradoxes, dictated by the spirit of party, by self-love and bad faith. Feeble in reasoning, as we presume the partisans of similar doctrines to be;—ready as they may be to feel satisfied with their own explanations, we cannot suppose them stupid enough to be satisfied with such miserable suppositions. And is it not better,—indeed, a hundred times more noble,—to candidly acknowledge our ignorance, and to confess that we do not comprehend the cause of this singular phenomenon, than to desire to impose on ourselves and on others by the most ridiculous explanations? We do not know what is the organic cause of periodicity or intermittence; it is not solely a form of irritation; irritation is not the principal phenomenon; it ought not to form the basis of our therapeutics; the appearances, which present themselves after death, are not the cause of the intermittence.

"The type of simple inflammation is continued; and when the

type is intermittent, there is something more than inflammation; the latter ceases to be simple and does not form the principal circumstance of the disease. When inflammation is found after the death of the patient, this inflammation can only be accessory; since, in ordinary cases, its progress is continued, and, in the majority of cases, intermittence takes place without it. The intermittent type is the principal phenomenon of these diseases, as upon it is founded the most heroic treatment that medicine possesses, and before which the pride of the pretended physiological medicine must bow.

“It is certain, however, that intermittent fevers almost uniformly exhibit themselves with some predominant functional expression. Hence, the genera adopted by the illustrious Pinel; hence the proofs that have been adduced in support of the existence of a phlegmasia in these kinds of fevers. But pathological anatomy is far from having sufficiently elucidated this point of doctrine, and even if we were to admit, that some organic lesion had constantly been found, it would always remain for us to determine why it should always give rise to intermittent phenomena.”

The nature of the morbid action in a paroxysm of intermittent fever is unknown to us. The first link in the chain of phenomena is probably connected with the nervous system, whose functions are strangely and inexplicably modified by the action of the great exciting cause—malaria: this is probably received into the system along with the air in inspiration; and, in a latent manner, exerts its agency for a time, before the explosion takes place. Under this modified condition of the nervous system, the action of the capillaries is morbidly impressed; a state similar to that of the internal congestion, which occurs in certain fevers, is produced; and continues for a time, until reaction is established; and the concentration of vital manifestations is turned towards the surface: this again subsides, and the functions of the skin, which had been interfered with in the cold and the hot stages, are now restored, and the cutaneous secretions are poured out in increased quantity to compensate for the previous deficiency. The apyrexia succeeds to the turmoil, and all remains tranquil; until, in process of time, similar scenes are enacted.

As to the laws that govern the periodical recurrence of agues, it may be well to admit at once our entire ignorance. We know nothing of the causes of that periodicity, which is observed in the action of various organs in health, any more than of those, which constitute the essence of various periodical diseases. There is probably a periodical movement within us at different periods of the day, which corresponds with the same period in other days, and gives rise to the exacerbations that we notice in hectic and other fevers. A marked case of this periodicity is seen in the recurrence of the catamenia; yet, although many views have been promulgated in regard to it, we are as much in the dark as were our ancestors.

Treatment.—The management of intermittent fever resolves

itself into that which is proper in the paroxysm, and that which is required to prevent its recurrence.

1. *During the paroxysm*, but little is generally needed. The natural sequence of phenomena—as has been shown—is a state of concentration, followed by one of expansion or reaction, and this, again, followed by a stage of relaxation or sweating. As the subsequent stage is modified by that of its precursor, it is, of course, important to diminish the duration of each stage as far as is practicable.

In the *cold stage*, hot diluents may be freely allowed, with heat to the external surface;—a bladder, half filled with hot water to the epigastrium, and hot applications to the soles of the feet. Of the means, to be employed prior to the supervention of the cold stage, for the purpose of mitigating its violence, mention will be made hereafter.

Of late years, it has been proposed to bleed in the cold stage. The practice has been warmly advocated by many in Great Britain, India, and in this country; but by others, it has been esteemed injurious,—probably, however, on faulty theoretical considerations. The old notion, entertained of the cold stage, was, that it was one of debility, and that the patient rather required remedies, which should prevent him from sinking. It has been seen, that, in reality, it consists of a recession of the vital activity from the circumference towards the centre, and that the phenomena are those of internal engorgement or congestion.

This latter view so strongly impressed a pathological writer of eminence, now no more, (*Mackintosh*), that he determined to employ blood-letting in the cold stage with the view of removing this engorgement, and when he was himself attacked with intermittent fever, he first put it in practice in his own case. The result was salutary; and, instead of danger supervening from debility, he felt manifest relief. (*Stokes*.) After this, he practised it repeatedly; and, to use his own language, found, that, in a great majority of instances, it cut the cold stage short. “In fact, it will rarely fail in stopping the existing paroxysm, and, on many occasions, it has prevented a return of the disease to which the patients had been long subject, and by which they were nearly worn out. It is difficult to determine what quantity of blood it will be necessary to draw in any given case; sometimes it requires twenty-four ounces; I have known three ounces suffice; and, in one case, an ounce and a half produced the full effect. The larger the orifice in the vein, the greater is the chance of arresting the disease at a small expense of blood; but, in many cases, the operation is attended with considerable difficulty from the convulsive tremors, which affect the whole body. I was once successful in arresting the disease by bleeding, in a cold stage, which had continued twenty-six hours; but I regard this as an extreme case. The blood sometimes only trickles down the arm; and, as the system is relieved, the stream becomes larger and stronger, till at last it springs from the orifice;

and, frequently before six ounces are taken, the patient will express relief from violent pain in the head and loins, and it will soon be observed, that he breathes more freely. The tremors become slighter and slighter, and by the time a few more ounces are abstracted, they will cease altogether, and with them will vanish the painful sensation of cold. The pulse will be found stronger, and a gentle moisture will be observed on the body. If the patient be properly managed with respect to bed-clothes, neither hot nor sweating stage will in general follow. Most of the patients who have been treated by myself, or by my pupils under my immediate inspection, have fallen asleep immediately after the operation; but some have even got up and dressed themselves." (*Mackintosh*.)

The experience of the practitioners of India in their intermittents is equally favourable. "The benefit of bleeding in the cold stage of intermittents"—says a recent writer, (*Twining*),—"is now so well known in India, that I need hardly say, that in a great number of cases it arrests the paroxysm, and is the best mode of preventing those ulterior visceral engorgements and indurations, which too often prolong the disease till the constitution is ruined. The patient should be bled in the recumbent posture, and permitted to lie quiet for an hour after the bleeding; and, during the paroxysm, he should not be heated with too much bed-clothes, but may be allowed a blanket in the cold season, or a sheet in the hot weather; he should be supplied with a cup of warm tea, or gruel, or thin sago, soon after the blood has ceased to flow. By these means, he will seldom have either a hot or sweating stage, and the majority of patients, who have used a sufficient course of mild purgatives before the bleeding, will not have a return of the paroxysm, provided they are tolerably well furnished with clothing, and not exposed to atmospheric vicissitudes."

In this country, so far as the author knows, the practice has not been much employed. Some cases have, however, been published, (*Higgason*, of Tennessee,) which are favourable to it. It is a plan by no means new in congestive fevers, combined or not with gentle excitants,—the abstraction of blood giving occasion to the exertion of a *vis à tergo* from the vessels in which the blood is accumulated, the gentle stimulation aiding in reëstablishing the equilibrium. For the reasons before stated, the taking away of blood in the cold stage of an intermittent is by no means liable to the objection of being unphilosophical. Although the organic actions may be subdued at the circumference, they are often energetically exerted at the centre; and the thermometer, placed under the tongue, will frequently be found to indicate a heat some degrees more elevated than that of health. Certain interesting experiments have been published, (*John Reid*), which bear a close relation to this subject. Dr. Reid found—as the result of several experiments on the lower animals—that disgorging the right side of the heart, when its contractions were enfeebled or suspended, by opening the jugular vein, had, in some cases, a decided effect in renewing its action; and the same

may, doubtless, occur from bleeding practised under the circumstances mentioned. It is important, indeed, to bear in mind, that congestion of the cavities of the heart speedily arrests the action of that viscus. (*Pennock*, of Philadelphia.)

The author has not practised blood-letting in the cold stage of intermittents, because he has not, at the time, considered it necessary, although he believes, that it may be practised with safety, and occasionally with advantage. During one epidemic, the practice was tried in Dublin in not less than one hundred cases, and the general conclusions were:—that, in the vast majority of cases, bleeding may be practised with safety; that there is very little or no danger of the patient dying of debility, as was formerly apprehended; and that, in many cases, the treatment was found to diminish the violence, and ameliorate the character of the paroxysms; and, in some, had the effect of completely arresting the disease. (*Stokes*.) Dr. Stokes found, however, that in some cases the cold, and, in others, the hot stage were increased in violence by it; and that in several cases the paroxysms were brought more closely together, and the period of their recurrence anticipated. This observation, Dr. Stokes remarks, was confirmed by his friend Mr. Gill, who visited the fenny part of Lincolnshire, during the prevalence of an epidemic ague, to put the practice to the test. In a communication made by Mr. Gill to Dr. Stokes, he stated, that he felt quite certain, he had it in his power to convert many cases of intermittent into continued fever by bleeding in the cold stage.

Between forty and fifty years ago, a plan was suggested (*Kellie*) for arresting the cold stage by applying pressure to the extremities. Dr. Kellie maintained as the result of his own observation, that if tourniquets be applied so as to obstruct the circulation in two of the extremities at any time during the cold stage, the hot stage would supervene in three minutes afterwards,—that if they be applied previous to the paroxysm, the cold stage will be wholly prevented; and that by such removal or prevention of the cold stage, the succeeding hot stage will be rendered milder and of shorter duration.

Dr. Kellie recommends, that the compression should be continued ten or fifteen minutes, when the symptoms of the hot stage will generally be moderated; but it ought seldom, he considers, to be continued much longer, as when this was done, he observed that the pulse, which had become fuller, stronger and slower, became smaller and more frequent, and when the tourniquets were removed, the rigors returned.

The author has occasionally employed the practice advised by Dr. Kellie, and with analogous results; still, it is very rarely used, and as the succession of stages, in ordinary intermittents, usually takes place with much regularity until they are arrested altogether by the means employed in the apyrexia, nothing more is usually needed than warmth and the simple excitants already recommended. The fact, however, that the phenomena can be interfered

with by the modification in the nervous and vascular functions induced by the compression, goes to prove—as has been well remarked, (*Stokes*,)—that ague is a nervous disease, “for if it were an intermittent gastro-enteritis, as the physiological school teach, how could it be possible to remove it by pressure on the extremities?”

When the state of concentration is giving way to one of expansion,—or, in other words, when the cold stage is passing away, and the *hot stage* is commencing, and *à fortiori*, when it is established, the clothing of the patient should be light, free ventilation be admitted, with cold drinks, cold or tepid ablution of the extremities, and the whole of the refrigerant medication and regimen. Blood-letting has been advised, but it can only be needed where active hyperæmia occurs in some internal organ. The hot stage is a part of the paroxysm, and will eventuate in the sweating stage, if no treatment at all be adopted; and, usually, no other agents are demanded except those belonging strictly to the class of refrigerants. No drugs certainly are needed; not even opium, which was at one time highly extolled both in this and the cold stage of intermittents. Its beneficial agency—where it has been experienced—is another exemplification of that pathology, which connects this disease largely with abnormous conditions of the nervous system, and it will be seen, that the effect of the agents employed during the interval corroborates greatly this view of the subject.

When the *sweating stage* is succeeding or has succeeded to the hot, it is usually sufficient to add somewhat to the clothing, but not so much as to encourage profuseness of the secretion. It has been advised to dry-rub the patient, and replace the wet with dry clothing, (*Shapter*;) but this cannot often be necessary; and, indeed, can rarely be done without inconvenience and some degree of danger. The sweating stage is a sequel of the hot stage, as the latter is of the cold stage, and more harm may arise from officiousness than from leaving this part of the paroxysm to itself.

In this—the sweating stage—tepid drinks may be permitted; cold drinks should be used with great caution, and the hot are neither advisable nor grateful. As good a rule as can be observed, in regard to drinks, throughout the paroxysm, is to permit hot drinks during the cold stage; cold drinks during the hot stage; and tepid drinks during the sweating stage.

Such is the general plan of treatment to be adopted during the paroxysm of an intermittent when of the simple kind. Should complications exist, they must of course be met; and much will depend upon the character of the endemic, as affected by locality, or by special epidemic influences, at particular seasons. Should local inflammation or hyperæmia complicate the paroxysm, bleeding may be needed here as where the same complications accompany other forms of fever. It is chiefly, however, during the apyrexia, that these can be appropriately combated, as the phenomena are greatly masked by those of the paroxysm.

If irritability of the stomach be present, the soda water, or the soda powders of the shops, in other words, carbonic acid, may be prescribed occasionally; or gentle stimulants, combined or not with small doses of laudanum,¹ may be administered; and if these should fail, a sinapism may be applied to the epigastric region. The revellent effect of a common cathartic enema is often, in such cases, highly serviceable.

¹ R.—Sp. æth. nitric. ʒj.

Tinct. opii, gtt. v.

Mist. camph. ʒxj.—fiat haustus.

It is as impracticable, as it would be unnecessary, to point out all the complications that may present themselves in the course of a paroxysm of ague. The intelligent practitioner will know how to combat them according to rules, that are laid down in the course of this work, when treating of those affections. The cases, however, of pernicious or malignant ague require a few remarks. The great danger, in these affections, is the concentration of the circulation in the interior, to so great an extent, that the patient may die of the congestion. Hence, it is important to cut short the cold stage, if practicable, and induce reaction as speedily as possible. This must be done by the remedies already recommended, and great discretion may have to be exercised by the physician, as to the precise mode of management; whether—for example,—it may not be advisable to take away a few ounces of blood from the arm, whilst, at the same time, he may be administering internally wine-whey, or some diffusible excitant;—holding the lancet, in other words, in one hand, whilst he is provided with an excitant in the other.

As soon as the hot stage is fully formed, the danger is mainly over. Should signs of hyperæmia or of inflammation in some internal viscus present themselves, topical bleeding or revellents—as blisters or sinapisms—may here, likewise, be demanded, whilst at the same time it may be necessary to support the powers by wine-whey, and other appropriate nourishment. In these forms of the disease, it is all important to prevent the paroxysms as speedily as possible: in the worst cases, the most imminent danger attends their recurrence,—the patient frequently dying in the second or third paroxysm.

2. *Treatment during the interval.*—As in all periodical diseases, the most important part of the management is during the interval, and the success of the practitioner is so great in all ordinary cases, that the treatment of intermittent fever has been regarded as more simple than that of any other disease; and in districts that are annually subject to the disease, it is treated by the patient himself, in many cases without applying to the physician. Since the discovery of the invaluable properties of the *Cinchona condaminea* and others,—the *bark*, as it has been called *par excellence*,—it has been generally employed except in domestic practice, and has been esteemed the “great specific:” the term “specific” may, indeed,

with as much propriety be employed in the case of the bark, as in that of any therapeutical agent whatever. It was very generally given in substance, but large doses being required, the insoluble ligneous matter frequently accumulated in the bowels so as to produce mischief,—so much, indeed, that one pathological writer of eminence (*Mackintosh*) remarks, that the question has often suggested itself to him, whether it was not more injurious than beneficial. Dr. Mackintosh observes, that he has seen it cause serious intestinal irritation, as displayed by griping pains in the bowels, diarrhœa and painful tenesmus. On examining the stools in these cases, they seemed to consist chiefly of bark, with a considerable quantity of mucus, occasionally tinged with blood. In another work, (*General Therapeutics*, p. 123, Philad. 1836,) the author has alluded to a case—not of intermittent fever—but in which this injurious effect of the powdered bark was exhibited. A young lady, of markedly scrophulous temperament, and somewhat predisposed to pulmonary consumption, was attacked with bilious fever, which was actively treated, and, in the course of three or four weeks, yielded; the debility, however, was so great as to induce the practitioner to prescribe a tonic; and the cinchona was selected, and administered in powder. After she had taken it for some days, vomiting and purging occurred, accompanied with occasional chills of the most distressing character. Bark was discharged in quantities in the evacuations; and, under the irregular actions, thus excited, tubercles—already present in the lungs—inflamed and suppurated, and this most rapidly; hectic fever, and every symptom attendant upon the confirmed stage of pulmonary consumption, supervened, and she gradually sank under the malady; yet no signs of phthisis were present prior to the derangement, produced by the bark, in a frame already debilitated by the previous malady.

With such objections to the cinchona in substance, and with the fact, that the ordinary preparations are of inferior efficacy, it is easy to appreciate the value of the discovery of a mode for separating the active principle from it. This was done upwards of twenty years ago, (1820,) and so rapidly and extensively was its efficacy promulgated, that in the year 1826, in two laboratories of Paris for the preparation of quinia, 59,000 ounces of the sulphate—the form best known and most frequently prescribed—were prepared. (See the author's *New Remedies*, 3d edit. p. 405, Philad. 1841.) For a time, the sulphate was obtained in this country from Paris; but at present, (1841,) the author is informed, from 6 to 8000 ounces are made in the course of the year in one laboratory in this city, (Philadelphia.) An additional evidence of the value of this discovery, was recently mentioned to the author:—although the best cinchona bark cannot be purchased, at this time, for less than one dollar and thirty-seven and a half cents per pound, and in powder for less than one dollar and fifty cents,—cinchona powder (so called) may be obtained for ten cents per pound. This consists of an admix-

ture of the false and other barks with the cinchona or true barks, and, generally perhaps, not a particle of the latter can be detected in it. Yet the appearance of the true and the spurious powder is so nearly alike, that no difference can be observed even by an experienced eye.

The plan usually pursued by the author, in the treatment of a simple intermittent, is as follows:—If the gastric functions be disordered, as indicated by furred tongue, nausea, want of appetite, &c., a gentle emetic may be exhibited, (*Pulv. ipecacuanhæ*, gr. xx,) with the view of removing the morbid secretions, and preparing the way for the action of the quinia upon the nerves of the lining membrane of the stomach; or it may be merely necessary to administer a gentle cathartic.

R.—*Pulv. rhei*, gr. x.
Magnes. gr. xv.
Pulv. zingib. gr. v.—M.

In the case of a tertian, this plan may be adopted on the day in which the paroxysm is not expected.

If the paroxysms have recurred regularly about the same hour—and these cases are the most manageable—a mixture of the sulphate of quinia is prepared of such strength, that five grains may be administered about an hour and a half before the paroxysm is expected, and five more in an hour afterwards.

R.—*Quiniæ sulphat.* gr. x.
Acid sulphuric. dil. gtt. viij
Aquæ, ℥iij.—M.
 One-half for a dose.

This will generally be sufficient to arrest the paroxysm; but if, notwithstanding, signs of the cold stage should appear, a draught, containing fifty or sixty drops of laudanum, may be administered, which will almost invariably be successful. This plan succeeds at least so generally, that the author has rarely found it necessary to have recourse to any other.

It has been already remarked, that intermittent fever must be regarded as a disease in which the function of innervation is largely concerned; and this view of the subject is supported by the effect of remedies. The precise mode in which they act in preventing these paroxysms, as well as others that are characterized by periodicity, is by no means clear. The only theory, however, which appears probable is, that they produce a new impression upon the nerves of the stomach, and through them on the nervous system generally; and that the new action, thus induced, is sufficient to break in upon the morbid catenation. This view is, at least, strengthened by the fact, that a powerful emotion has been found to produce a similar effect with the tonic; has completely prevented an expected attack, and, even after its inception, has removed it. Accordingly, fear is ranked, by many practical writers, amongst the febrifuges or antiperiodics to be employed in ague;

and the efforts of the tractorizer and the animal magnetizer exert their influence in the same manner.

Under these views, the author prefers administering the sulphate of quinia in solution to the pilular form advised by many. If the object be to produce a new impression on the nerves, it is obviously advisable to make the revulsion as extensive as possible. This is effected by the quinia in solution, which not only exerts its wonted influence upon the nerves of the lining membrane of the stomach, but likewise upon the gustatory nerves,—the impression on the latter being by no means slight or transient.

The mode of administering the quinia, advised above, is not approved by all. Some prefer distributing the ten grains through the twenty-four hours of the apyrexia of a tertian, in divided doses.

Recently, it has been strongly recommended to administer much larger doses of the remedy,—from twenty to one hundred grains, for example, during the apyrexia, and as much as twenty to thirty grains, and even more, in a dose. (*Piorry, Nonat, Bally, Flint*, of Buffalo.) There is no question, that the revellent effects, produced by these large doses, will often be successful, when smaller doses are ineffectual; but in the cases that have fallen under the author's care, in different parts of the globe, these large quantities have been unnecessary. In such doses, it produces, at times, narcotic effects, (*T. Fearn*, of Alabama,) and occasionally influences certain nerves especially, causing inability of utterance, (*Scott, Ménage, Heming*,) and in others deafness, (*Jos. Williams, C. R. Bree*;) but these effects soon pass away.

The state of the stomach sometimes forbids the use of the quinia by the mouth. If all means have failed in allaying the gastric irritability, the quinia may be used in the way of enema,—six grains or more being mixed with thin starch, and thrown up a short time before the paroxysm or at the inception of the same. When used endermically, from four to eight grains of the sulphate may be sprinkled or applied in the form of ointment on a blistered part, once or oftener in the day. The blister may be placed over the epigastric region.

Very lately, several cases of successful treatment of intermittents have been published, (*G. Lane Corbin*, of Virginia,) in which the blistered surfaces were “coated” with the sulphate of quinia, or treated with plasters formed—of sulphate of quinia, 5 drachms, simple cerate, 4 ounces, incorporated well together, and spread of the thickness of a blistering plaster. The sulphate of quinia has likewise been used iatraceutically;—forty or fifty grains being mixed with two ounces of lard, and a portion of this rubbed in on the groins and armpits three times a day. (*Nonat*.)

Various preparations of the quinia, besides the sulphate, have been employed,—as the acetate, the citrate, the ferrocyanate, the muriate, the nitrate, and the phosphate, but they possess no advantages over the sulphate. (See the author's *New Remedies*, 3d edit. p. 404–423: Philad. 1841.) The Pharmacopœia of the United

States had likewise a *Quiniæ sulphas impurus*, which is made by evaporating the liquor, poured off the crystals of sulphate of quinia, to the consistence of a pilular mass, and has been known in Philadelphia under the name of *Extract of quinine*. Twenty-four grains of this, given between the paroxysms, has generally arrested an intermittent. (*Professor Wood*, of Philadelphia.)

The active principles of certain other vegetable substances have been administered with the same view as the quinia. That of the willows—salicine—is one of these, respecting the value of which, sentiments are, however, discrepant. It certainly merits no preference over quinia, even in price; for, although an equal weight of salicine may cost less, it requires so much more to produce the same effect, that the cost is perhaps equal. It is, however, of home manufacture, and can, therefore, be obtained in war as well as in peace. (*Pleischl*.) The ordinary dose is four to six grains, given every three hours in the apyrexia: or, like the sulphate of quinia, it may be given in larger doses a short time before the anticipated paroxysm.

By the Italian physicians more especially, piperine, obtained from the black and the long pepper, has been highly extolled, but a difference of opinion exists as to its antiperiodic virtues. By some, it has been regarded as the best of all, (*Meli*;) and, by many, as fully equal to any. (*Brandolini, Bertini, Gordini*.) It is given in the form of pill.

R.—Piperin. gr. xii.

Extract. gentian. q. s. ut fiant pilulæ xii.

Dose, one, every hour during the apyrexia.

Still more recently, phloridzine, obtained from the bark of the root of the appletree; and cetrarine, from the cetraria islandica, have been recommended in intermittents, but they are scarcely ever employed. Their properties are detailed in another work, (*New Remedies*, 3d edit. Philad. 1841.)

In certain cases, even the most active of these preparations fails. The sulphate of quinia may be administered carefully and assiduously; and, notwithstanding, but little impression may be made on the disease. In these rare cases, the author has found the powdered cinchona at times successful; a circumstance which would appear to show, either that the cinchona may contain other active antiperiodic principles besides the sulphate of quinia, or that the insoluble ligneous matter,—however objectionable it may occasionally prove, by accumulating in and disordering the intestinal canal,—may still exert some influence, by aiding in inducing the new nervous impression, which arrests the intermittent. A drachm of the powdered cinchona is generally as much as the stomach will bear; and from half an ounce to an ounce, administered judiciously in the apyrexia of a tertian intermittent, will commonly be sufficient. Or an ordinary dose of the sulphate of quinia may be given in the cold infusion of bark.

The quinia is so easily attainable, that the indigenous remedies,

formerly so much employed, have nearly gone out of use. The bark of the dogwood—*Cornus florida*, *C. sericea* and *C. circinata*—of the tulip tree or *liriodendron tulipifera*, and of the *æsculus hippocastanum* or horse-chesnut, and the root of the *aristolochia serpentaria* or Virginia snakeroot, have been long known as antiperiodics in ague; the last being frequently associated with the cinchona. The bark of the horse-chesnut has been proposed in modern times, (*Zannichelli, Hufeland, Voigtel*), as the best substitute for the cinchona, when neither it nor its active principles can be procured. In the wars of Napoleon, when bark was very scarce, it was much used, and the Pharmacopœia of Prussia contains a formula for a *Pulvis chinæ factitius*.

R.—Cort. hippocast.

C. salicis.

Rad. gentian. rubr.

Calam. aromat.

Caryophyll. āā, ʒij.—M. et fiat pulvis.

This powder, it has been affirmed, is an adequate substitute for the cinchona in three cases out of four. (*Hufeland*.)

These are the chief vegetable febrifuges, employed in intermittents of late years, and, therefore, those only that are worthy of the attention of the therapist of the present day. The catalogue might, however, be largely extended.

Arsenic has been long prescribed for the cure of this disease. In the fenny districts of England, an empirical preparation, under the name of “tasteless ague drop,” was long implicitly relied on. On the strength of the recommendation of Dr. Fowler, the liquor arsenicalis—a solution of arsenite of potassa—commonly called “Fowler’s solution,” was admitted into the pharmacopœias. It is unquestionably possessed of efficacy, as an antiperiodic,¹ and has been conceived by one writer, (*Brown*), from extensive experience, to be superior to the bark in substance, but inferior to the sulphate of quinia.

¹ R.—Liq. arsenical. gtt. v—viii ex. aquæ cyatho.

This quantity to be given every four or five hours during the apyrexia.

It may be administered in cases where the quinia is found to be inadequate, or where it disagrees; but it is liable to disorder the system, especially the digestive organs, when long continued; and it is affirmed—the author has not, however, met with a case of the kind—that under these deleterious agencies, some individuals “have sunk in the course of a few years; others continued to drag on a miserable existence.” (*Stokes*.) We should, therefore, as Dr. Stokes has properly remarked, “decline its employment, whenever we can dispense with it, and though we may not be able to procure Peruvian bark, or sulphate of quinia, we should recollect, that there are many other astringent barks, possessed of febrifuge properties, and which may be employed with safety and advantage.”

The cyanuret of iron has been highly extolled in ague by many practitioners. (*Zollickoffer, Eberle, Hosack, Wutzer, Stokes*.)

Dr. Stokes places quinia first, Fowler's solution second, and the cyanuret of iron third in the scale of value. Some have given six or eight grains every four hours during the apyrexia; others from a scruple to half a dram three times a day. The author has often administered it, especially in hospital practice, as it is a cheap remedy; but he has found it very far inferior to the cinchona and its preparations, as well as to the different indigenous tonics before mentioned.

In all cases of intermittents, before attempting to arrest the paroxysms by antiperiodics, it is important to remove any concentration of vital activity towards internal organs, otherwise the most energetic agents will utterly fail in their effects; and, in the pernicious forms of intermittents, it is of moment to take advantage of every interval, however brief it may be, for the administration of the sulphate of quinia in as large doses as can be borne. The great danger lies in the excessive disturbance of function occurring during the fits, and they must therefore be prevented, if practicable.

In an ordinary case of simple intermittent, the food of the patient, during the apyrexia, should be light and nutritious; and the clothing be carefully attended to. The slightest error in regimen, or exposure to cold and moisture,—even a powerful moral emotion, will recall the disease, especially if the patient remain in the locality where he has incurred it. It is essential to remove him to a more healthy situation; and the revulsion, thus induced, often most powerfully aids the action of therapeutical agents.

In the way of prevention, in aguish districts, the patient should not expose himself to the night air; flannel should be worn next the skin, and undue exposure to atmospheric vicissitudes be avoided; but, in many situations, every care is insufficient to shield the inhabitants from the attacks of their annual visitant.

In regard to the sequelæ of intermittents, much need not be said here; as they have been treated of under the respective heads. These sequelæ are hypertrophy of the liver or spleen, hydropic effusions, &c. As remarked under Hypertrophy of the Spleen, it fortunately happens, that the same remedy, which is adapted for the prevention of the paroxysms—the sulphate of quinia—appears to be equally adapted for the removal of splenic engorgement. But should this not succeed, recourse must be had to some of the other agents there indicated, and the same may be said of the other diseases, that occasionally follow in its train. Of late, it has been affirmed by some pathologists of France, that intermittent fever is primarily an affection of the spleen. Certain it is, that engorgement of that viscus, which may ultimately become hypertrophy, is one of its attendants; and there can be little doubt, perhaps, that such hypertrophy may be the cause of relapses of the intermittent. (*Bally, Nonat, Piorry.*)

SECTION II.

REMITTENT FEVER.

SYNON. Febris remittens, Febris continua remittens, Epanetus; *Fr.* Fievrè rémittente; *Ger.* Nachlassende Fieber.

In the most marked cases of remittent fever, there are distinct paroxysms alternating with remissions,—one of these usually taking place every twenty-four hours. The disease is, consequently, intermediate between intermittent and continued fever. It has, indeed—as elsewhere remarked—been doubted, whether continued fever should be received into our nosological arrangements; and, with propriety perhaps, all its forms might be considered under the head of Remittent Fever; for, if we carefully notice the cases that are classed under continued fever, we can scarcely fail to observe, that in some part of the day, the febrile symptoms are more severe than in others.

Still, custom has sanctioned a division of remittent fever, in which those exacerbations, and the remissions between them, are more evident; and which are more frequently seen in climates of great atmospheric heat, and in paludal districts of the same. In such situations, they frequently resemble intermittents so closely, that, by many writers, they are classed under the same head.

Remittent fever, in different countries, assumes different aspects, although essentially the same disease. In this country, we see it annually under the more simple form of our bilious fever. On the shores of the Mediterranean, it appears with certain modifications; in the East Indies, and in the southern part of the United States, we observe it under the form of the endemic fever; and the epidemic yellow fever of this and other countries has been referred to it; although, on this subject, much difference of opinion exists; and they certainly appear to be, anatomically, different diseases.

For convenience of investigation, it may be advisable to inquire, *first*, into the simple form of remittent; and *secondly*, into the malignant remittent; the former of which is extremely common over the whole of the United States; and the latter not unfrequently occurs in the summer and autumnal months in the southern and western portions more especially.

1. *Simple Remittent Fever.*

SYNON. Epanetus mitis, Remittens mitis, Febris biliosa, F. polycholica, Synochus biliosus, Febris gastrica; F. cholericæ, Bilious fever, Gastric fever, Gastro-enteritis with bilious complication; *Fr.* Fievrè rémittente simple, F. bilieuse, F. gastrique; *Ger.* Gallenfieber.

Diagnosis.—Simple remittent fever, where the atmospheric temperature is elevated, prevails everywhere in marshy districts to a greater or less extent, and in India where a dense underwood

exists, it is to be met with from the simplest form of Jungle or Hill fever to the most aggravated varieties. It has been properly remarked, that no concise definition could be framed, that would comprise all the varieties of remittent fever; since we find, that their predominant characters are greatly modified by the prevailing constitution of the atmosphere at the time, and by the habits and conduct of the individuals who suffer from the disease, as well as by their peculiarities of constitution; but more especially by peculiarities in the locality, or by particular occurrences affecting it for a season, such as inundations from the sea, or the overflowing of rivers, or untimely rain, and a clouded, foggy, hot and moist atmosphere. The nature and extent of the local affections also give rise to peculiar symptoms and modifications of these diseases. (*Twining.*)

In many situations, the autumnal remittents, of the most healthy seasons appear to differ but little from those forms of intermittent that are accompanied with disorder of the gastric functions; but, at other times, the remittents strikingly resemble the pernicious forms of intermittents.

The common bilious fever of this country partakes greatly of the continued fever:—that is, in many cases, the remissions are by no means marked, and the disease often runs its course in about the same time as the ordinary fevers that are unattended with any gastric complication.

The prodromic symptoms of remittents are analogous to those of intermittents;—differ so little, indeed, from them, as not to require re-enumeration. The rigors are rarely, however, so great, and, sometimes, the sense of chilliness is wholly, or almost wholly, absent. At times, vague chills, or a sensation as of cold water trickling down the back, alternate with flushings of heat, until ultimately the fever is completely established. At this time, if not previously, great pain is experienced in the head, neck and lumbar region; and in the extremities. The condition of the tongue, which is covered usually with a brownish coat; the nausea and vomiting—often of bile; the sense of painful weight and tension in the epigastric and hypochondriac regions; the yellowish hue of the tunica conjunctiva, and the bilious impregnation of the urine sufficiently indicate the gastro-enteric or bilious complication. The pulse is generally full and frequent,—not hard, as in active inflammation; and the skin is hot and dry.

This febrile condition continues for a longer or shorter period, generally for a few hours, when a gentle perspiration breaks out upon the upper parts of the body, and sometimes generally. The symptoms now yield; but still only to a certain extent. It is a *remission*, not an *intermission*. This lull commonly continues for a short time only, perhaps for an hour or two; when all the preceding functional phenomena recur, and often in an aggravated manner.

These exacerbations are repeated, until either the remissions

become prolonged, the fever ceases altogether; or the remissions become less and less perceptible, and the fever is continued. The last is so frequent an occurrence in the autumnal fevers of many parts of the United States, as to sanction the remark, already made, that the ordinary bilious fever of the country partakes greatly of continued fever. From the very first, indeed, it may often happen, that the remissions are so slight as not to be readily perceived either by the patient or the physician; and, in some instances of an aggravated character, they may be for a time altogether inconspicuous or absent. (*Prof. Eberle, of Cincinnati.*)

If the disease has been severe from the first, or if it has gone beyond the first week, the symptoms assume greater severity; the fever is constant; the tongue becomes more and more furred or dry, especially along the middle; and signs of the typhoid state frequently supervene; such as delirium, sinking of the powers; meteorism, with tenderness of the abdomen on pressure; diarrhoea, &c., which may go on progressively augmenting, until the disease terminates fatally.

One of the most important circumstances to be borne in mind in the history of remittent fever, is,—the tendency to local hyperæmia or inflammation; the presence of which gives the peculiar characters, by which we find the remittent of one season distinguished from that of another. In all cases, perhaps, the lining membrane of the stomach or small intestines, or of both, is implicated; and hence the term “gastric” so universally applied to it. In hot climates and seasons, an unusual degree of *erethism* exists in the gastro-enteric mucous membrane, which, under the influence of the causes of remittent fever, and the irregular actions occurring in the course of the disease, is developed into inflammation of greater or less severity. Where it is to a great degree, it spreads along the biliary ducts to the liver; for a time, arrests the secretion of the bile, and gives occasion to functional phenomena denoting hepatic complication,—such as pain and sense of fulness in the right hypochondrium; absence of bile in the matters evacuated by vomiting, and in the alvine evacuations; yellowness of the surface of the body, and especially of the tunica conjunctiva.

After a while, however, in favourable cases, this hyperæmic or inflamed condition of the liver passes away, and the restoration of the hepatic functions is denoted by the evacuation of a dark pitch-like matter, which has been esteemed *critical*; but probably denotes nothing more than that the pathological cause of the deficient biliary secretion has passed away, and that the engorgement, which was the cause of the detention of the bile in the gall-bladder and ducts, had subsided. In other cases, where the gastro-enteric hyperæmia is not so great, the hepatic symptoms may be less marked, or be indicated for the first few days simply by a yellowish tinge of the conjunctiva, denoting, that the secretion is not freely poured into the small intestine. The liver, in this case, instead of having its secretion locked up, as it were, in the gall-bladder and

ducts,—after the first few days is merely excited to greater secretion, and, accordingly, the disease is accompanied by a copious flow of bile, which is indicated in the evacuations both by vomiting and stool. According, therefore, to the degree of gastro-enteritis existing in any individual case, we may have signs of absence or of undue quantity of bile in the evacuations; but, in both cases, the liver is affected secondarily,—a slight irritation in the lining membrane of the duodenum acting in the same manner as one of our cholagogue cathartics; the irritation, produced by it, being communicated, in the manner above mentioned, along the ductus communis choledochus and the hepatic duct to the liver, and along the cystic duct to the gall-bladder; so that the former is excited to greater activity of secretion, and the latter to a more frequent discharge of its contents.

Causes, and pathological characters.—Of these we shall treat under the next variety of Remittent Fever.

Treatment.—The management of ordinary bilious fever has become, in many regions of this country, a matter so completely of routine, that, as in the case of intermittents, it is often treated at home, without the aid of the physician. In many parts, bleeding and large doses of calomel are relied on; but if, either owing to the severity of the case, or to its aggravation by cathartics, the disease proves unmanageable, the physician is appealed to, and it, doubtless, often happens, that under such circumstances, cases prove fatal, which, had he been called earlier, might have eventuated in health.

In all these cases, in which such large doses of calomel are administered, the practitioner or the layman, whichever it may be, is led to persuade himself, that the climate requires them. But this argument—as elsewhere remarked—(*General Therapeutics*, p. 49: Philada. 1836,) is frequently fallacious and unfortunate, inasmuch as it prevents the adoption of any other plan of treatment, and, consequently, precludes all comparison. It has been a common opinion, that in our ordinary bilious fevers, copious blood-letting and the most active, and therefore irritating, cathartics are demanded; and the practice, founded on this belief, was at one time universal in this city, (Philadelphia,) and elsewhere; so much so, indeed, that no other was extensively adopted until of late years; but since a greater degree of attention has been paid to the pathology of the gastro-enteric mucous membrane in those affections, and since better reflection has suggested, that whilst we are keeping the different sensitive organs, which are seated externally, free from all irritation, we ought not to be perpetually irritating the lining membrane of the stomach and bowels, itself already in an excited condition, the employment of irritating cathartics has been pretty generally abandoned. The digestive canal is now kept clear, and daily clear by means of mild cathartics, which remove the morbid secretions as they are formed, and prevent accumulation of any kind in the canal; whilst the inflammatory and febrile excite-

ment is subdued by the proper use of sedatives—of which blood-letting is almost the only one—and of refrigerants. The experience of the author has sufficiently demonstrated to his own satisfaction, that the ordinary bilious fevers of this country will be found to yield far more readily under such a course, than under the mixed sedative and perturbing treatment, which was formerly universal, and still prevails too extensively. In those days—of no distant date—it was laid down, very properly, as all-important, that the excitant influence of light and noise should be excluded from the sick chamber; and that mental and corporeal quiet should be enjoined; but, at the same time, the practitioner did not hesitate to prescribe an irritating cathartic, which could not fail to excite an already over-excited internal sensitive surface, and compelled the patient to rise from bed perhaps eight or ten times in the course of the twenty-four hours! Where such a system of management—faulty as it was—was universal, it was impracticable—as before remarked—to deduce any inference in regard to its being demanded by the climate. To do this it was indispensable to make an equal trial of various methods, which was rarely, or never done.

Again, cathartics act but secondarily as sedatives. Their first impression is unquestionably as local excitants, in consequence of which the secretion, that proves depletive, ensues; and under the disturbance induced by the more active remedies of the class, it can be readily understood, that more mischief may be done by their excitant, than good by their antiphlogistic agency.

To one who has been taught, that the old method of managing our ordinary febrile diseases is essential, and who has employed no other, the success, which attends this milder, more soothing and more philosophical treatment, may scarcely be credited. It is, however, so generally successful, that the author is prepared to repeat an observation made six years ago, (*General Therapeutics*, p. 546, Philada. 1836,) as the result of his public and private experience, that death from typhoid or bilious fever is—in his observation—an uncommon event. The results of his experience in this matter are confirmed by that of others. “Follicular enteritis,” says an experienced observer, (*Professor Jackson*, of Philadelphia,) known more familiarly under the names of typhoid fever, typhoid remittent and bilious fever, I find to be infinitely more manageable, when treated with occasionally local depletion, as it may be indicated by local symptoms, the expectant method, and alterative doses, than by the perturbing and evacuant plan. Under this course I rarely see it fatal.”

The antiphlogistic or sedative treatment is, doubtless, the main stay of the practitioner in all febrile maladies; but still, mild evacuants are absolutely necessary throughout the whole course of those diseases; and, when they become protracted,—upon the principle of revulsion, agents may be demanded, the propriety of which, in the earlier periods of the disease, might be more than questionable.

The plan of treatment most advisable in an ordinary case of remittent fever is the following:

When the organic actions are very much exalted, as indicated by the ordinary signs of febrile excitement, it may be necessary to take away blood from the arm, if the practitioner be called upon early in the disease; but, in the majority of cases, this is not needed, unless some hyperæmic affection is apparent in an internal organ. Should such a condition exist, it may be advisable to bleed both generally and locally: the gastric complication will usually, indeed, suggest the application of cups or of leeches over the epigastrium in the course of the disease.

Throughout the affection, the patient should be kept in bed, and the air be freely admitted, unless it should excite a feeling of chilliness; the bed-clothes should be regulated according to the feelings, and the whole refrigerant regimen be adopted, allowing ice-water freely, whenever the skin is steadily hot and dry; but in smaller quantities—or not at all—when the surface is moist. There is, indeed, in the whole catalogue of our therapeutical agents, none that is perhaps as efficacious as ice, combined with the refrigerant regimen generally. As a part of this must be included cold or tepid sponging of the extremities, which may be used under the circumstances before mentioned,—that is, whenever the skin is steadily hot and dry.

Mental and corporeal quiet should be strictly enjoined; and, therefore, no more light or noise should be permitted than is absolutely necessary. In like manner, the alimentary canal should be kept clear daily by gentle cathartics, as by small doses of the oleum ricini, (ʒj.—ʒiij.); rhubarb and magnesia;¹ or sulphate of magnesia alone or united with magnesia;² and in the latter periods of the disease—and frequently indeed in the earlier stages—it may be necessary to administer an enema daily; and a dose of the cathartics, above recommended, at an interval of several days.

¹ R.—Pulv. rhei, gr. x.

Magnesiae,

Pulv. zingib. āā gr. v.—M.

² R.—Magnesiæ sulph. ʒvj.

Aq. menthæ pip. ʒiv.—M.

Dose, one quarter, night and morning, if necessary.—Or,

R.—Magnesiæ sulphat. ʒiij.

Magnesiæ carbonatis, ʒj.—M.

Dose, one quarter, night and morning.

The enema removes the evacuations chiefly from the lower part of the intestinal tube; but it likewise solicits the peristaltic action downwards, so as to evacuate the whole canal,—not perfectly, however, and hence an occasional cathartic, given by the mouth, may be advisable.

It is not requisite to administer an emetic unless signs of morbid secretion in the stomach should be manifest. In such case, one of the mildest may be prescribed, (*pulv. ipecacuanhæ*, gr. xv.—xx.) in consequence of the irritation that is usually present in the gastro-enteric mucous membrane.

As the cutaneous transpiration is generally diminished, it has

been laid down as an indication, that in this, as well as in other fevers, the transpiration should be restored. Accordingly, diaphoretics, and some of them of a most objectionable character, have been proposed. We have, in reality, no agents, that prove diaphoretic under all circumstances; and, therefore, the true mode of restoring diaphoresis, is to remove the pathological condition on which the obstruction is dependent. When it is removed, a diaphoresis breaks out, and this has led to the idea, in all ages, that the diaphoresis is an effort of nature, which is "critical," and puts an end to the disease. The matter of fact would seem to be, that as soon as a decided improvement has taken place, diaphoresis is established, and, therefore, it is rather the index than the cause of a favourable change in the malady. Under such views, the efforts of the author are always directed, throughout the disease, to the removal of the diseased organic actions; and, accordingly, he has found the class of refrigerants infinitely more valuable than that of reputed diaphoretics. The routinist prescribes internally his "nitrous powders,"¹ "to correct the morbid condition of the liver, skin, and alimentary canal," (*Prof. Eberle*, of Cincinnati;) or his mixture of the liquor ammoniæ acetatis, or nitre; and so long as the doses are not excitant, little or no mischief may arise, provided the sedative system is adopted in all other respects. Time passes on, and the disease runs its course spontaneously to a favourable issue.

¹ R.—Pulv. nitrat. potass. 3j.

Pulv. ipecac.

Hydrarg. chlorid. mit. āā gr. xij.—M. et divide in partes vj. æquales.

One of these to be given every two or three hours.

Not many ages have elapsed since, in the treatment of all febrile affections, it was generally esteemed improper to adopt a cooling system. Fever was supposed to be owing to some morbid matter in the blood-vessels, which required to be "concocted" or matured, before it could be expelled from the body; and as heat was found to be necessary for the concocting or maturing of matters out of the body, it was conceived, that such concoction, in the pathological conditions referred to, might be promoted by the application of warmth externally, as well as internally, or by the adoption of what was termed the "heating regimen." Every effort was accordingly made to induce sweating, by which—it was thought—the "peccant" humour might be evacuated; and this was one of the reasons, why the establishment of a copious diaphoresis came to be esteemed "critical." Reflecting minds began, however, to doubt, whether the theory, and the system of management founded upon it, were philosophical, notwithstanding that it was affirmed, as in all similar cases, to be sanctioned by positive experience; but it was not until the time of Sydenham, that any great innovation was introduced in the treatment of febrile and inflammatory diseases. That great observer determined to examine for himself, and not to be guided by the dicta of his predecessors and contemporaries, but to adopt that system, which

rational inquiry suggested. In spite of all assertions regarding the dangers of adopting the cooling regimen, he unhesitatingly had recourse to it—upon the principle, that where the organic actions are elevated, and the temperature of the system is increased, and where cold is instinctively and anxiously demanded, the true plan of management must be, to temper the morbid heat, and reduce over-excitement by the admission of cool air and the appropriate use of cooling drinks. No greater improvement has been made in the therapeutics of internal diseases than this: the mortality from febrile affections has been largely diminished; and one disease that was wont to figure prominently in our nosological catalogues—the miliary fever—has almost disappeared from our observation. This affection was extremely common in the childbed state; and that it was induced by the erethism of the cutaneous surface, occasioned by the prevalent heating plan of treatment, is satisfactorily shown by the fact, that it is now rarely seen—except where that plan has been adopted.

Every rational practitioner of the present day admits, that of all internal refrigerants, cold water—ice cold—is the most effectual; yet occasionally, amongst the uninformed, we meet with apprehensions on this score—the relics of ancient belief;—and with those who are afraid to employ cold as freely as it is advised by the practitioner. The dread of very cold fluids after calomel has been administered is especially entertained. This notion appears to have arisen from the fact, that when the system has been in the very impressible state which mercury—given to such an extent as to occasion its peculiar effects—induces, irregular actions have been observed to follow exposure to cold; and hence it has been inferred, that a similar result might ensue on the application of a cold fluid to the lining membrane of the stomach, after even a single dose of a mercurial has been taken. All experience, however, shows, that the two agents are by no means incompatible; and did any doubt exist on the subject, and should a question arise as to whether the mercury or the ice water should be dispensed with, we should not hesitate, in the large majority of cases, to adhere to the latter.

It is an interesting point to determine, whether certain agents, generally esteemed to be capable of tempering morbid heat, and hence termed “internal refrigerants,” are entitled to the reputation which they have enjoyed. A well known writer on materia medica, (*Paris*,) affirms, that “there are *certain saline substances*, which, by undergoing a rapid solution, and acquiring an increased capacity for caloric, produce a diminution of temperature; and if this takes place in the stomach, the sensation of cold which it produces is equivalent to a partial abstraction of stimulus; this, being extended by sympathy to the heart, occasions a transient reduction in the force of the circulation, and by this, or by a similar sympathetic affection, causes a sensation of cold over the whole body.”

This definition applies, however, but little to the main articles of

the materia medica, that have been looked upon as internal refrigerants. These are the nitrate of potassa, the borate of soda, and the boracic acid,—formerly termed *Sal sedativus Hombergi*. The two last may be banished from the list; for although we are compelled to infer, that experience must have sanctioned their introduction into the lists of the materia medica, a later, and probably a better, experience has caused them to be regarded as by no means entitled to the character formerly bestowed upon them.

The definition, by Dr. Paris and others, of an internal refrigerant, refers only to “saline substances,” which, “by undergoing a rapid solution in the stomach,” produce a diminution in the temperature of that viscus. We have not an agent, however, which corresponds with this definition,—certainly, not the nitrate of potassa, for that is always dissolved before it is taken; and even were it not, the slight diminution in temperature caused by the solution could scarcely be productive of greater advantage, than a like diminution produced in any other way, as by taking cold water of the same temperature.

Experience sufficiently shows, that, as regards the nitrate of potassa, it is an excitant, and that it is only refrigerant, when it comes rigorously under the definition before given, that is, “when it undergoes a rapid solution, and acquiring an increased capacity for caloric, produces a diminution of temperature, and if this takes place in the stomach, the sensation of cold, which it produces, is equivalent to a partial abstraction of stimulus.” (*Paris.*)

But although refrigerant only under these circumstances, the nitrate of potassa has been generally ranked as an “internal refrigerant,” and the same may be said of the saline ingredients, that constitute the common saline or neutral mixture. In the prescriptions of the physician these are commonly directed to be prepared, that is dissolved, in the shop of the apothecary; are kept in the sick chamber; and administered, at the temperature of the chamber, in divided doses, during the day. Yet, notwithstanding these reflections, suggested by an attention to “rational therapeutics,” we ought to bow to the weight of evidence, did experience show that the nitrate of potassa is really capable of exerting a refrigerant influence; but experience—as already remarked—shows it to be not temperant but exciting. It may be said, however, that the use of this agent, as well as of the saline mixture, has really been found beneficial in fever; but it may be doubted, whether the practitioner ought to place reliance upon either one or the other, except as agents in the fulfilment of a temporizing or palliative policy. When the saline mixture is administered in a state of effervescence, it is often most grateful to the patient, and the impression, made on the stomach by the carbonic acid gas, disengaged by the union of the vegetable acid and the carbonated alkali, exerts, at times, a pleasing influence. But when the saline mixture, or the solution of the nitrate of potassa, is administered, as above described, the salutary influence may be occasioned, after all, in many cases, by

the confidence reposed by the practitioner in his "febrifuge mixture:" under this confidence, he is less likely to interfere with the diseased organic actions in the officious and perturbing manner so often practised; and, in this way, the use of a comparatively inert compound may be followed by positive benefit.

The refrigerant method, guided by sound judgment as to its form and extent, is, in the author's opinion, far more to be relied on than the administration of diaphoretics; and in this respect, he is happy to find, that his experience coincides with that of one who had numerous opportunities for observation in the bilious remittent fevers of the Mediterranean, (*Sir William Burnett.*) Sir William states, that sudorifics have never appeared to be attended with the smallest advantage, especially when employed in the early stage. They certainly, as he properly observes, often fail to induce perspiration, and, moreover, at the commencement of the disease, the patient is often covered with a profuse perspiration from which it derives no relief. Under the view of the author, that there is no such thing as a direct diaphoretic, and that, in all cases, diaphoresis must be induced by removing the condition, which gives rise to its diminution or arrestation, there may be agents, usually classed amongst diaphoretics, which might be of benefit; but to employ excitant diaphoretics in all cases cannot fail to add to the mischief; and, accordingly, almost all diaphoretics, except the refrigerant, are generally abandoned. Nauseants—as the preparations of antimony—are, indeed, administered, but they are given under the views just mentioned. The action of nausea on the organic actions is one of sedation. When, therefore, nauseants are administered to the necessary extent, they reduce the organic actions, which give rise to the suppression of perspiration, and, in this way prove diaphoretic. (See the author's *General Therapeutics*, p. 285, Philad. 1836.)

During the existence of simple remittent fever, should any sign of hyperæmia or of inflammation of any internal organ present itself, it must be met by revellents,—as by cupping, blisters, sinapisms, &c.

One writer of this country, (*Professor Eberle*, of Cincinnati,) has recommended the revellent action of mercurials from the very first. Under his view, that calomel has the power of altering the morbid condition of the liver, and of the whole capillary system, he is of opinion, that taking also into consideration its gentle aperient effects on the bowels, it is peculiarly calculated to do good in this disease. Under these hypothetical views, he advises, that the calomel should be early and regularly administered, and continued until slight manifestations of its specific influence on the system are noticed on the gums. When these occur, its use must be suspended. Dr. Eberle remarks, that he had employed this remedy in nearly every case of remittent fever, which had come under his management during fifteen years, where he had been called to the patient during the first two or three days of the disease; and, in a

great majority of cases, he found all the symptoms of the disease abate, and often very considerably, as soon as the mercurial influence became conspicuous, and, in many instances, a speedy convalescence ensued. He thinks, however, that although a very gentle mercurial impression is generally decidedly beneficial in this malady, strong mercurialization or ptyalism appears to be as generally detrimental,—at least in the ordinary remittents of this climate; and he thinks, that, in the advanced periods of the disease, the constitutional operation of mercury will be much more apt to prove injurious than beneficial. (*Ferguson.*) In general, he adds, the salutary influence of mercury is restricted to the first five or six days of the disease; and the earlier its general operation can be procured, the more certainly will it prove advantageous.

Dr. Eberle's testimony does not, however, do much more than establish the fact, that the ordinary remittents of this country will terminate favourably, when mercury is administered; and he might have added, that they terminate equally favourably in the hands of those who pursue the general principles of treatment inculcated in this section, and yet who never employ mercury. His own experience could not enable him to make any comparison of different methods of treatment, inasmuch as he states, that for more than fifteen years he had employed the remedy "in nearly every case of remittent fever," which had fallen under his management. The author, on the other hand, scarcely ever employs mercurials in the early stages of the disease. The morbid condition of the liver, he believes to be dependent upon the state of the lining membrane of the stomach and duodenum, and with this belief he avoids every thing that could add to the erethism there seated. But when the disease has proceeded beyond the second week, and the associated actions keep nearly at the same point; and especially where adynamic symptoms present themselves, he has seen great apparent benefit from the administration of mercury so as to induce a new action, and break in upon the morbid mischief already present. His experience differs, therefore, in this respect, from that of the intelligent writer, whom he has cited.

In regard to the diet in a case of simple remittent, it must be carefully attended to. Of the use of ice and cold water, mention has already been made: lemonade, barley-water acidulated with lemon-juice; currant jelly mixed with water; gum arabic dissolved in water and acidulated and flavoured with lemon-juice and lemon-peel may be allowed, and, gradually, the farinaceous decoctions of arrow-root, sago, &c.

2. *Malignant Remittent Fever.*

SYNON. Pernicious remittent, Epanetus malignus, Remittens maligna; *Fr.* Fièvre remittente pernicieuse; *Ger.* Bosartige nachlassende Fieber.

Diagnosis.—Remittent fever may run its course in the manner described; or, from being mild and simple at its commencement, it

may extend beyond the second week, and present functional phenomena characterized by great adynamia and ataxia. The tongue becomes more and more loaded with a brown fur; there is more or less delirium, with intense heat during the exacerbations, and all the signs—as before observed—that characterize the typhoid state.

In many parts of this country, and in the marshy districts of the torrid zone, remittents are rarely of the simple kind, but are extremely violent and malignant from the very first. Under such circumstances, the cold stage is generally of brief duration; but, contrary to what is usually observed in intermittent fever, the succeeding fever is extremely violent, and accompanied by excruciating headache, pain in the back and limbs, anxiety, dyspnoea and distressing feeling of weight and oppression in the epigastrium. These symptoms usually continue for about twenty-four hours, when a considerable remission, frequently amounting almost to an intermission, occurs, which, however, is not of long duration. A second paroxysm supervenes of greater severity than the first, which terminates sooner or later with a clammy perspiration. The eyes, during these attacks, are often yellow, watery, and red, and the oppression at the epigastrium is excessive. The paroxysms are repeated, if the disease be left to itself, until either a termination occurs by resolution or by death; and this not uncommonly happens in the third paroxysm. If the disease persists beyond the fifth or sixth paroxysm, great prostration supervenes; the remissions become less and less distinct; delirium almost always is present; the skin is either pungently hot, or clammy cold; and, not unfrequently, all the signs exist that characterize typhus fever. Petechiæ, vibices, and hemorrhages, are occasionally present. (*Professor Eberle, of Cincinnati.*)

Examples of this violent form of remittent have fallen under the notice of the author in the temperate region of Virginia. A family proceeding up James River in the heat of the latter part of summer, were compelled to have the windows of the cabin open during the night. On their arrival in the upper country, they were attacked with malignant remittent; and, notwithstanding every care, the mother and one of the children died; the others were saved mainly by the vigorous exhibition of the sulphate of quinia during the partial remissions.

The more malignant forms of remittent, which occur during unhealthy seasons, resemble greatly the pernicious fevers to which allusion has been made under the head of Intermittents. They are essentially congestive in their character, and hence the name *congestive fever*, that has been given to them in the southern parts of this Union, where they prevail most destructively in certain years. All the symptoms of the disease indicate extreme congestion of blood in the great central organs. It is marked by the early accession of symptoms of debility, oppressed respiration, small, weak pulse, anxiety, prolonged cold perspirations, faintness, cold livid

extremities, &c. &c. When the disease assumes this shape, it is alarmingly fatal; and, in our own country, is often most destructive, —receiving, at times, in the south, the name of the *cold plague*.

The remittent fever of the Bengal rainy season is said to rank amongst the most formidable diseases of India; whilst it continues, the patient can scarcely be considered free from danger, although he may not appear to suffer much, and there may be no symptom of violent reaction. It sometimes happens, that after two or three slight paroxysms, a change for the worse suddenly takes place, without any evident cause, and death follows within an hour. (*Twining.*)

In very severe cases of this kind, after the second or third paroxysm, each decline of the fever, which generally occurs from 12 to about 4 o'clock in the day, is followed by profuse perspiration, prostration, and coldness of surface, attended with a torpid state, and a tendency to stupor in some cases, and extreme apprehension of impending evil in others. At the conclusion of the fourth or fifth paroxysm, and sometimes earlier, some patients continue to become weaker and colder until they die. In the more intense paroxysms of the disease, there are two periods of each paroxysm, which are fraught with danger; one is during the increase of morbid heat, when febrile excitement and high arterial action exist, and there is tendency to fatal congestion and effusion into the encephalon or other important organs; the other is at the conclusion of the paroxysm, when morbid excitement and high vascular action have diminished or ceased; when the vessels of the surface are in a state of relaxation, and languor and debility prevail. In some of these cases, the patient sinks gradually into a state which bears some resemblance to the collapse that succeeds to the low form of cholera and to syncope; and the coldness persists until the patient dies. (*Twining.*)

The malignant form of remittent is very liable to be complicated with some organic mischief. The alimentary canal, the liver and the brain, are especially affected. The symptoms, which announce those complications, are intelligible enough. They are those in fact of subacute gastritis, hepatitis, and encephalitis. Occasionally, too, the bronchial tubes participate in the morbid condition. In particular varieties of the disease, there is a strong impression on the mind of the patient that he is about to die, an impression, which no arguments can remove. In this disease, as in all febrile affections, it is an unfortunate impression, and renders the situation of the patient more precarious. A writer, indeed, who has had experience in this matter, (*Brown,*) affirms, that he does not know whether this impression is to be considered a mental illusion or not; for in every case, which had fallen under his observation, the patient's prediction had been fulfilled.

In very malignant cases, like those which are observed in many parts of Italy, the disease proves fatal in the first three paroxysms, and is accompanied by delirium, which subsides into coma, from

which the patient does not recover. When it occurs at a later period it may be owing to encephalitis, or to some of the diseases of the internal viscera, that are so apt to be induced by it. At other times, death occurs, as in other febrile affections, in consequence of the patient being worn out by irritation, without there being a predominant lesion of any organ,—which is manifested, at least, by disorder in the functional phenomena.

Causes.—Remittent fever has usually been referred to the same emanations that give rise to intermittents. It is one of the affections considered, in other words, by almost all pathologists, to be of malarious origin. It is clear, however, that the terrestrial emanations must be different from those that give occasion to intermittents, inasmuch as we observe it very commonly in localities where intermittents are wholly unknown. The bilious remittent fever, moreover, prevails at certain seasons to a greater or less extent every where; and, at times, is observed to be decidedly epidemic, and to visit regions, in which it had been but rarely seen before. In certain parts of the southern states in which occasional cases of severe bilious remittents are seen every summer, it sometimes appears with fatal malignity, as in the summer of 1839, and affects a large proportion of the population. In such cases, the disease is doubtless endemico-epidemic in its nature, or depends upon a conjunction of a favouring condition of the atmosphere, with appropriate terrestrial emanations; and, unless this favourable conjunction exists, the disease is not produced. This is the cause why it is so much more prevalent in some years than in others, and why it occasionally appears epidemically in situations where it was previously almost unknown.

On all occasions, in which epidemic disease prevails, it is an interesting object of inquiry, to determine the precise nature of the malarious influence; but, as yet, we are in entire darkness on the subject. We know that excessive heat induces great erethism in the gastro-intestinal mucous membrane, and it may be of itself sufficient to develop the disease in question. Usually, it is, doubtless, associated with some terrestrial emanation, of which, however, we know nothing. It differs, probably,—as already remarked—from that which occasions intermittents, as the latter does from the agency which is concerned in the production of goître, pellagra, and other diseases that are endemic in particular situations. As in the case of intermittents, the vegetable and the animal kingdom have been looked to as furnishing the emanations that produce remittents. Perhaps they may be concerned. There seems, at least, to be more probability that they are causes of remittents than of intermittents. Under the influence of high atmospheric temperature, acting in the manner above described, such emanations may be concerned in their causation. In ships proceeding from the torrid climes, the disease has broken out under circumstances which could not easily be explained under other suppositions. On our wharves, too, it has appeared to be caused in a

similar manner. Cases of this kind we shall refer to again, under the head of Yellow Fever.

At other times, endemico-epidemic fever would seem, under favourable atmospheric influences, to be generated by animal decomposition. Some interesting cases of the kind were communicated, not long ago, to the author. (*William Maxwell Wood*, of the United States Navy.) They occurred in a small coral neck, of twelve acres extent, called Indian Key, at the southern extremity of Florida. Its surface, with the exception of a few insulated trees, presents a naked, white, clean exposure of carbonate of lime, and there is not on the key a natural receptacle for water as large as a wash-hand basin,—rain being collected in cisterns for the use of the inhabitants, who number from 50 to 60. The houses, which have all been erected upon the plan of a single proprietor, are neat, new, one story cottages, separate from each other, raised two or three feet from the ground, on stone supports, and ranged around the island, facing the ocean, with a large open space behind them; the breezes from the sea having a clear sweep over the key, and through all the buildings. There is nothing to generate vegetable miasmata, and the place is remarkably free from disease. Thirteen men, in charge of an officer, were quartered in two of these cottages. Some weeks afterwards, Dr. Wood found the officer and one of the men under violent febrile disease. Subsequently, two others were attacked. Three of these cases proved fatal, under excessive encephalic disturbance.

The other men, with their baggage, were removed on board ship; but, amongst them, several cases appeared, marked by cerebral oppression, nervous agitation, and but little disposition to reaction; intense pain in the head, back and limbs; the skin and conjunctiva assuming from the third to the fifth day a very yellow tinge. The disease likewise exhibited itself amongst those who had simply visited the houses on shore, and, in these cases, it presented a different type, the tendency to reaction being greater, and the grade of fever much higher. All the phenomena of the disease—Dr. Wood remarks—were such as he has seen resulting from the influence of “marsh miasmata,” in its various degrees of action, from the condition of overpowering congestion, seen in the “cold plague” of the Mississippi, to the symptoms marking the yellow fever of the southern states and the West Indies.

An attentive examination of the houses, although it indicated a want of cleanliness, showed no accumulation of decomposed vegetables anywhere; but there was an oppressive, animal, jail-like smell, which seemed to emanate from the houses themselves. There had been much and continued intemperance amongst the men, and part of a barrel of spoiled salt beef, which was very offensive, had been covered with fresh brine, and served out as the men's rations. This beef was stowed in one of the out-houses, and had been just consumed when Dr. Wood arrived at the Key.

These were all the facts that could be collected during the researches into the cause of the disease. The points in this singular

endemico-epidemic, which were striking, are:—the entire absence of general or local vegetable miasmata; the concentration of the poison, as seen in the prostration of the powers of life; the very short exposure to its influence required to generate the disease; and its insulation, there being no case among the inhabitants of the Key, although the neighbouring cottages were occupied. (*Dr. W. M. Wood.*)

In sporadic cases of remittent fever, both of the simple and the malignant form, malarious influence may not, perhaps, be necessary to engender it. It *may* be sufficient that gastro-enteritis is induced, in order that, under favourable circumstances, it may assume the remittent form. The infantile remittent fever of authors, is an affection of this kind. It is a febrile disorder, which is generally found to depend on irritation, inflammation or ulceration of the mucous membrane of the digestive tube. (*Mackintosh.*)

Pathological characters.—These are very various; but they are chiefly met with in the stomach, liver or brain; predominating in one organ rather than another, in accordance with the symptoms during life. Hyperæmia is almost always present, and, usually, there are marked signs of inflammation. Gastro-enteritis usually exists, and, not unfrequently, the follicular form, or what has been termed *dothineritis*. Under another head, it will be stated, that this last form of enteritis prevails chiefly in typhoid fever; but still it is met with in the remittent form. The researches of an intelligent observer, and one of the author's colleagues in the Philadelphia Hospital, (*Gerhard*, of Philadelphia,) have led him to pronounce, that the "anatomical character" of the malignant remittent and intermittent fevers, which sometimes occur in the malarious parts of the country that are situate within a short distance of Philadelphia, and probably also in the southern states, is to be looked for in the spleen, liver and stomach; and he thinks that "the bilious and remittent fevers are probably referable to the same class as the malignant remittents." The glands of Peyer and the other intestinal follicles, he found perfectly healthy.

The results of Dr. Gerhard's observations do not, however, accord altogether with those of the author; and the discrepancy is probably owing, in part, to the difference presented by the remittents of various years. No matter what may be the form of fever, however, provided there is diarrhœa and meteorism, we need not be surprised to meet with follicular enteritis to a greater or less extent.

The Baltimore Infirmary formerly afforded, and probably still affords, a good field for the observation of those affections; and nothing was more common, in fatal cases of remittent and intermittent fevers, than to observe inflammation, or evidence of its having previously existed, in the mucous membrane of the small intestine, and in the follicles belonging to it. "As far back as 1822," observes a colleague of the author when he was professor in the University of Maryland, (*Professor Geddings*, of Charleston,) "we had occasion to recognize the enlargement and

inflammation of the intestinal follicles of an infant, who died of an attack of autumnal fever, on the second day after the attack, in consequence of the supervention of convulsions. We have repeatedly met with it in those who had died at an early period of bilious remittent, yellow and typhoid fevers; and wherever fever, whatever may have been its primary form, has been protracted, we do not remember to have seen a case in which some evidence of follicular gastro-enteritis, either in form of enlargement of the follicles, punctuated redness, extravasation, &c. did not exist; obscure in some cases, it is true, but always sufficiently apparent when the intestine was fairly laid open, carefully cleansed, and held between the eye and a strong light, or examined with a magnifying glass."

Such must likewise have been the results of the observation of another distinguished observer, (*Professor Jackson*, of Philadelphia,) who speaks of "follicular enteritis known more familiarly under the names of typhoid fever, typhoid remittent and bilious fever;" and follicular gastro-enteritis is declared, on the authority of Professor Stevens, of New York, and of Dr. Vaché, physician to the Bellevue Hospital, to be notoriously of common occurrence in the bilious remittent fevers of New York. (*Professor Paine*, of New York.)

A very recent writer and accurate observer, (*Stewardson*, of Philadelphia,) found on the examination of those who died under his charge as physician to the Pennsylvania Hospital, during the years 1838, 1839, and 1840, lesions of the spleen and liver in every case, and development of the glands of Brunner in the duodenum; and he considers, that their frequent enlargement and uniform distinctness constituted a striking peculiarity of the disease: the stomach likewise was very frequently inflamed.

In the cases, observed by Dr. Stewardson, the essential anatomical characteristic of the disease appeared to be the morbid condition of the liver, which was found to be flabby, of a bronze colour, the two substances blended together so as to be scarcely distinguishable: the spleen was much enlarged and softened.

In the remittent fevers of India, examination after death shows, that they are almost invariably connected with local hyperæmia, which often runs rapidly into inflammation, attended with much interstitial effusion. (*Twining*.) The seat of these local affections is principally the stomach, intestines, cellular structure about the duodenum, and at the root of the mesocolon, especially where it passes across the spine: the principal disease is likewise often found in the spleen, liver, brain or lungs. There is a great diversity in the relative degree to which the local affection extends. Sometimes, the brain and stomach seem to be almost exclusively affected; in other cases, the spleen, intestines and lungs; and, in others, the liver.

Such are the main appearances met with in those who have died of remittent fever; but it is obvious they must differ almost *ad infinitum*. In a disease attended with so much irregularity of

the functions of innervation and circulation, and implicating the general system, there is scarcely an organ, which may not give evidences of hyperæmia, if not of active inflammation.

Where such numerous opportunities exist annually, in the southern and western portions of this country, for investigating the anatomical characters of our remittent fevers, it is to be regretted, that they are so rarely embraced. A fine field is afforded for the enterprising pathologist, and we doubt not, that if it were cultivated, distinctive differences, analogous perhaps to those pointed out by Dr. Stewardson, might be discovered, which would shed great light on this interesting malady, and tend to fix its precise pathological character.

As in other febrile and inflammatory diseases, the blood becomes modified in its characters, and the view has been maintained, (*Stevens*,) that remittents originate in a disorganized state of this fluid, as indicated by its black crimson colour, which Dr. Stevens considers to be owing to the entire removal, or great diminution, of its saline ingredients. This altered condition of the blood, he thinks, induces a morbid modification of the action of the solids as certainly as fever is induced by the injection of a putrid and poisonous fluid directly into the blood-vessels. The altered condition of the blood cannot be contested, but it may admit of great question, whether it ought to be regarded as the first link in the chain of phenomena. The evidence is, indeed greatly in favour of its being but one of the multitudinous changes induced in the organism by an attack of remittent fever.

Treatment.—In the very severe forms of remittents, that occur in the southern regions of this country, and in the torrid climes generally, the gastric complication is usually extremely urgent, and the stomach is frequently so irritable as not to bear either emetics or cathartics. Blood-letting has been found, in such cases, beneficial, especially where the arterial reaction was very violent. One efficient bleeding, employed early, has checked promptly the excessive irritability of the stomach and retching; after which sinapisms may be applied to the epigastric region. Ice is often efficacious in this respect: as well as the effervescing draught, or ice-cold soda water. For forming the effervescing draught, the common soda powders will be found to answer every purpose. Lime-water and milk, and all the ordinary remedies for checking vomiting, have also been used. Counter-irritants applied elsewhere—as sinapisms to the calves of the legs—have likewise been found to diminish speedily the irritability of the stomach. (*Professor Eberle*, of Cincinnati.)

In all cases in which blood-letting is practised, it should be done early; as very material changes are apt to supervene rapidly in the tolerance of patients as to this remedy. In the remittents of India, the most important feature is the rapidity with which changes take place, both in the disease, and in the powers of the constitution, even in the course of one paroxysm; and the treatment, which, if

employed at an early stage of the accession, would be judicious and afford not only immediate relief, but tend greatly to moderate the violence and alter the character of succeeding paroxysms of the disease,—if employed later in the paroxysm, would be liable, in many cases, to destroy the patient in two hours, nay sometimes in a few minutes. (*Twining.*)

After the first or second paroxysm, general bleeding has to be practised with caution; but, at any time,—if the violence of arterial action appears to be considerable, and augmenting,—leeches may be applied to the epigastrium, and, if the head suffers materially, to the temples.

It appears to be the opinion of the generality of writers, who have witnessed remittent fevers in their greatest malignity, that large doses of calomel are necessary,—according to most, owing to the liver being generally congested, torpid or otherwise deranged to a great degree; and, consequently, our remedial efforts should in their view, be particularly directed to that viscus, (*Eberle*, of Cincinnati;) but, can we have any reason for believing, that calomel or any other agent can act on a “liver, congested, torpid or otherwise deranged;”—in other words, be a specific in all affections of the liver? In this country, and in India, large doses of mercurials are administered, not so much with the view of inducing violent catharsis, as to make the new impression upon the system, which is peculiar to mercury; and under this new pathological condition, which mercury induces, the morbid train—as in many other maladies—is broken in upon. The liver, not exclusively, but along with the other secreting organs, has its functions modified, and it is probably by this revellent action, that benefit accrues in remittent fever as in other analogous disorders.

To make an early and decided mercurial impression upon the system, it is generally advised, that the calomel should be given in large and frequent doses,—twenty grains, for example, every four or five hours;—and that it should be continued, until the gums exhibit its influence, or the evacuations become conspicuously bilious. Should it not prove cathartic, any of the gentle cathartics, recommended under the head of simple remittent fever, may be employed in addition.

In these severe forms of remittent fever, it is admitted, that the ordinary diaphoretic remedies are of little or no advantage. (*Professor Eberle*, of Cincinnati.) It has been already remarked, that in the simpler form, but little dependence should be placed upon any except the refrigerant class. In the severer grades, under consideration, cold or cool drinks,—soda water in ounce bottles kept cold, or the ordinary soda powders may be allowed; or lemonade, tamarind water, and similar acidulous and cooling mixtures.

In some of the severer remittents, the employment of antiperiodics has appeared to be injurious, and has, consequently, been reprobated by many practitioners. Perhaps, however, some of the evils may have resulted from the administration of the cinchona in substance.

Since the discovery of the quinia, we have been in possession of a remedy, which disagrees less with the stomach and bowels; and on which great reliance has been placed in the severe remittents of the south and west of the United States. Where there is any visceral hyperæmia, the sulphate of quinia may be productive of no advantage, even when the remission is great; but in such case no agent would be of service, until the hyperæmia was removed; but it by no means follows, that it would prove injurious. In all such cases, it must be given in large doses, and at short intervals, so as to make a decided impression, and prevent the recurrence of the exacerbation. Such is the plan found effective in the malignant remittents of India. It must be borne in mind, too, that even in the less severe cases, the prompt exhibition of the sulphate of quinia, by arresting the recurrence of the paroxysms, may prevent those visceral diseases, and the impaired state of the constitution, with debility, which are often met with in protracted cases. Life, says a modern writer on the remittents of India, (*Twining*,) often depends on the management of a single paroxysm, by the judicious employment of the lancet, a purgative, and two or three large doses of the sulphate of quinia.

In a case of severe remittent, which fell under the care of a respectable practitioner of this country, (*Dr. Thos. Fearn*, of Huntsville, Alabama,) three teaspoonsfuls, weighing thirty-two grains, of the sulphate of quinia were given at a dose; and, at the end of an hour, there was a diminution of the frequency of the pulse,—the invariable effect, *Dr. Fearn* observes, of large doses of quinia, when its operation is favourable. The dose was repeated, and, at the end of another hour, it was again given,—making ninety-six grains in two hours. *Dr. Fearn* states, that his usual practice in remittent fever, has been to give three doses of twenty grains each, with an interval of an hour between.

A similar practice,—as remarked hereafter,—was successful in the epidemic yellow fever, as it prevailed to the south in the year 1839.

These doses are, perhaps, larger than necessary, but they establish the value of the remedy, and the importance of seizing hold of the earliest remissions to administer it. In India, it is given in much smaller doses, and it is probable, that five or ten grains, administered every hour, during the remission, would be ample.

During the period of convalescence, mild tonics,—as the cold infusion of cinchona, the infusions of gentian, calumba, &c.—are advisable, and, indeed, the whole therapeutical and hygienic treatment, that appertains to convalescence from other severe maladies.

Throughout the disease, tranquillity both of body and mind should be enjoined; and barley-water, gum-water, or gruel may be directed; with the farinaceous preparations,—as arrow-root, or sago, as the disease advances and the powers fail. When adynamia is considerable, it has, of course to be met in the same manner

as when it follows other febrile diseases, always bearing in recollection, the great tendency of the disease under consideration to induce hyperæmia, and serious mischief in certain of the internal organs.

In some of the western parts of the United States a disease prevails, termed the *Milk sickness* or *trembles*—of the nature and causes of which there is much difference of sentiment; some, however, deny, that it is a distinct disease, and regard it as a form of gastro-enteritis, (*N. Crookshank*, of Ohio;) and others as nothing more than an autumnal fever of a congestive type, attended with great irritability of the stomach. Thus far, the causes would seem to be wholly unknown; but it would appear, that in the state of Ohio, transforming the surface of the infected districts by the hand of art has been found infallible. (*Professor Drake*, of Louisville.)

The disease is considered to be produced in man, by eating the flesh of animals that are infected with it; and it is affirmed, that butter and cheese, manufactured from the milk of the diseased animal, are the most concentrated forms of the poison, although they may possess no appearance, smell, or taste, which distinguish them from the healthy article. (*G. B. Graff*, of Illinois.)

The treatment, which has been found most effective has been that required in remittent fever, subjected to modifications that may suggest themselves in the course of the disease.

It is affirmed by a recent writer, (*Professor Drake*,) that an undue importance has, in his opinion, been attached to the disease. "The mortality from it is very small, compared with that from many other maladies, about the causes of which we make few inquiries. There can be no doubt, that more persons annually die in the West, from autumnal fever, than have died of milk sickness, from the commencement of its settlement. Even in the districts where the disease is endemic, it does not destroy as many as pleurisy or cholera morbus."

3. *Yellow Fever.*

SYNON. Febris flava, F. Americana, Morbus Siamensis, Typhus tropicus, Typhus icterodes Indiarum occidentalium, Pestis occidentalis, Vomitus niger, Epanetus malignus flavus, Remittens icterodes, Tritæophya Americana, Typhus of the West, Vomito negro, Vomito prieto, Bulam Fever, Barcelona Fever; Fr. Fièvre jaune, F. matelote, F. de Siam, Mal de Siam, Maladie de Siam, F. typhoïde d'Amérique, Typhus d'Amérique; Ger. Gelbe Fieber.

The different views that have been entertained in regard to the nature of this common fever of certain climes are sufficiently indicated by the synonymes. The cause of this appears to be, that no form of fever is more variable in the violence and character of its symptoms. Where it prevails endemically, it is often termed the "strangers' fever;" and, although of great danger to the new comer—to those who are acclimated, it is often not more severe than the simple remittent fever of the country.

By some, however, (*Stevens*), the "seasoning fever" of the West Indies is considered to be distinct from the yellow fever, and to be easily distinguishable, particularly in the beginning. In the former, Dr. Stevens remarks, there is no premonitory stage or cold fit; no inflammation of the stomach or liver; the tongue is clean, and the pulse full and incompressible; yet, in those who have not been seasoned, and who are young and robust, it, at times, makes its attack with overwhelming force; often terminating fatally within forty-eight hours, and sometimes earlier.

It has already been stated, that a yellow suffusion of the surface is frequently seen in severe remittents; and in India, an intense yellow hue of the skin is every year observed, in fevers of considerable severity; yet yellow fever is scarcely to be accounted an endemic of Bengal. (*Twining*.)

Although, to the resident of climates in which yellow fever prevails yearly as an endemic, the disease, in this form, is one of deep interest,—to the inhabitants of other countries, it has been interesting only as an epidemic, or rather endemico-epidemic. In certain of the towns of the United States, situate to the south, a "strangers' fever" is witnessed annually, sometimes with more malignity than at others; but, in other cities, as New York, Philadelphia, Baltimore, &c., its visitation having occurred at long intervals,—and the same remark applies to certain ports of southern Europe,—the characters which it presents, and the mode of origin and management have given occasion to much comment and controversy. It is of the last, that we shall treat chiefly;—believing, from all that has been written on this matter, that the endemic and epidemic forms are essentially varieties of the same affection, and that both bear analogy to the remittent fever already described. It was remarked, indeed, in Charleston, in 1804, (*Ramsay*, of Charleston,) that neglected intermittents frequently terminated in yellow fever; that during the yellow fever of Philadelphia, in 1802, intermittents, the mild remittent, the inflammatory, bilious, and the malignant yellow fever, in many instances, ran into each other, (*Professor Rush*, of Philadelphia,) and that in the yellow fever of the same city, in 1803, as the fever receded from the low ground and malignant atmosphere, which favoured or gave origin to it, it became more and more mild and manageable, until its "evanescent shades" were in many instances much lighter than the common remittent of the country. (*Professor Caldwell*, of Louisville.)

In Baltimore, too, it was noticed, that the bilious or remitting fever prevailed in its ordinary form, and continued until it was gradually lost in the severer forms of yellow fever, as the season advanced. (*Professor Davidge*, of Baltimore.)

Diagnosis.—Epidemic yellow fever has been well studied, in the yellow fever of Gibraltar, of 1828, more especially. A commission was appointed by the French government to investigate it. This commission consisted of MM. Gendrin, Trousseau and

Louis; and they were aided, in part of their researches, by Mr. Fraser, surgeon of the civil hospital, and Messrs. Gilkrest and Smith, surgeons of the English forces. "In the midst of universal desolation," says M. Louis, (American edition, by *Dr. Shattuck*, Jun., of Boston,) "our observations were taken with great care. We had time enough, and our professional brethren afforded us every facility for a thorough examination of the bodies, being themselves present at the autopsies; and we, that is, M. Trousseau and myself, were fully aware of the importance of a study of the pathology of the disease, even supposing the necessary information on the origin and mode of propagation of the epidemic to be obtained in the documents collected by the commission. We felt that, independently of the task which our government had imposed on us, we owed it to our profession to study the disease before us, and this, too, more carefully, if not more minutely, than we should have studied an ordinary malady."

The symptoms of the disease have, likewise, been observed by practitioners on this side of the Atlantic, and under opportunities, in certain of our cities, which—it is to be hoped—may never again present themselves.

The symptoms are described by M. Louis, as they occurred in the fever of Gibraltar, *first*, in fatal cases; *secondly*, in severe cases that recovered; and *thirdly*, in slight cases, which also recovered.

1. The *fatal cases* commenced with intense headache, accompanied by chills, shivering, pains in the limbs; and, soon afterwards, pain in the back. Heat, not often intense, succeeded to the chills, and this was sometimes followed by perspiration. At the same time, the face became red and animated, and, in some cases, swollen. The eyes were red, glistening, suffused, and the patients often complained of a sensation of smarting in them. Thirst was intense, and loss of appetite complete.

Pain at the epigastrium usually supervened in fifteen or twenty hours from the onset of the disease. It was generally inconsiderable, and very few complained of severe or acute pain. Along with the pain in the epigastrium, nausea and vomiting occurred,—at times induced by drinks or by cathartics, at others occurring spontaneously. Where no cathartics had been administered, the evacuations were infrequent. The abdomen was soft and not painful to the touch, except in the epigastric region. The sleep was inconsiderable. Some were restless; and, in others, there was a good deal of jactitation during the night. The smaller proportion experienced, as early as the third day, great anxiety, and could not remain in any one posture; and, in some cases, there was delirium; but this symptom did not usually come on till the last day of life, and, consequently, was considered rather to belong to the agony than to the disease. (*Louis*.) With few exceptions, there was neither prostration nor stupor. The pulse was moderately accelerated, regular, and commonly bearing relation to the degree of heat,

which was generally slight. The skin of the chest was injected in some cases; but this redness, as well as that of the eyes, diminished towards the middle period of the disease, or a little later, and new symptoms appeared. To the injection of the integuments of the chest, there succeeded a slight yellow tint of the part, and the eyes were of the same colour. When this colour appeared thirty-six or forty-eight hours before death, it became rapidly brighter, so as to be of some intensity at the time of the fatal termination. In other cases, in which it came on only just before death, it was slight at the time of the examination of the body, and commonly limited to the trunk. About this period, or a little later, the matter vomited, from being of a yellow colour, became brown or black, and the alvine evacuations were blackish or black also. At this period, too, the uneasy feelings and the anxiety persisted for a longer or shorter time, and in different degrees; the strength diminished; the temperature of the body fell, so that the limbs were cold before the agony, and, in certain cases, there was suppression of urine.

Even in fatal cases, the disease has sometimes an appearance of mildness, which is deceptive. The fever, and the pains, wherever seated, are slight; there is no agitation or delirium, and not any great diminution of strength, so that neither the patient, his physician, nor his friends are alarmed. Under this form of disease, patients died at times without taking to their beds,—on foot, as was remarked by their friends. Nor did the severity of the symptoms always correspond with that of the lesions.

2. In *severe cases in patients who recovered*, the early symptoms differed only in degree from those of the fatal cases. In some patients, the stools became black, and in a few—and these mostly children—the brown or black vomit occurred. In a great many cases, there was no yellowness, and in the majority of instances in which it was found, it came on from the fourth to the sixth day of the disease. The extreme restlessness, the jactitation, which took place in those who died, was not met with in any of these cases. Towards the fifth day, the symptoms became less severe; the skin cooler; the pulse calm; the pain at the epigastrium diminished or totally disappeared; the thirst was less; the appetite returned, and convalescence commenced.

3. The *mild cases* began with the usual symptoms very slight in degree. In the progress of the disease, the epigastric pains were rare, as well as the vomitings, which were scarcely ever spontaneous, and in no case of a brown colour. So slight was the diminution of strength, that the patients either did not keep their beds at all, or were there for a short time—say half a day only; thus, to use their own expression, going through the disease on foot. In several of these cases, the febrile symptoms were very slight, continuing only for 24 or 36 hours; yet these persons were exempt from any other disease in the course of the epidemic, although exposed to all the causes, which could have produced the yellow

fever in them, and it was likewise remarked, that persons, who had been thus slightly affected in the epidemic of 1804, passed uninjured through the epidemics of 1818, 1824 and 1828. This mild form was principally observed in children.

In regard to the more immediate diagnosis of yellow fever, there can be no difficulty in the severe and fatal cases, especially should there be a manifest epidemic. The great irritability of the stomach, the black vomit, and the yellowness of the skin are pathognomonic. In mild cases, however, where there is no declared epidemic, difficulty may be experienced; and it has been already remarked, that during the existence of an unquestioned epidemic yellow fever in a given locality, the situations in proximity with it may exhibit merely an unusual prevalence of cases, that appear to be the ordinary remittent fever of the season. In the mild cases, that occurred in the epidemic of 1828, at Gibraltar, all the more or less characteristic symptoms were often wanting. Often there was no vomiting, and never the black vomit, black evacuations, yellowness, or unwonted anxiety. The disease seemed to consist of slight febrile symptoms, to which were added more or less intense headache, pain in the limbs, back and loins, and commonly redness of the eyes; but the sense of debility was so slight, that many did not even keep their beds. These cases could not be regarded as yellow fever under ordinary circumstances; but if many similar cases were observed in a short space of time, in the months of August and September, and in the latitude in which yellow fever prevails; if the eyes were injected from the commencement; the countenance red, the headache intense, the epigastrium sensible to pressure, yellow fever might be strongly suspected, although the existence of an epidemic might not have been declared.

It has been considered, that there could be no doubts as to this point, even if the symptoms existed in the slightest degree only, where the disease attacked all the members, or the greater part of the members of one family in the midst of an epidemic, and in a short space of time; since of diseases of this kind, there is no other than yellow fever, which would attack a great number of persons of the same family in so short a space of time. (*Louis*.) This last argument does not, however, strike us so forcibly as it does M. Louis, as it certainly might apply to epidemic fever of every kind prevailing extensively.

In fatal cases, should doubt exist as to the character of the disease, a microscopic examination may remove it. In the great majority of cases, a greater or less quantity of black matter will be found in the stomach and intestines; and in all cases, as will be stated hereafter, there will probably be more or less disease of the liver of a peculiar character.

The ordinary duration of yellow fever is from five to seven days. If the patient passes the sixth day without the occurrence of black vomit, his chances of recovery are much increased; but even after

this, he may be carried off under symptoms of typhus. Relapses are by no means uncommon.

The mortality from epidemic yellow fever is always great. In the Gibraltar fever of 1828, according to a calculation made by the commission from 600 cases, short histories of which had been taken, the mortality was in the proportion of one to six and a half. It varied, however, according to age and sex. Of children attacked, a seventh part only died; of women, one in five and a half; and of men, one in four and a half. (*Louis.*)

M. Louis observes, that the same symptoms had not the same value in prognosis at all periods of life; for instance, the black vomit, which in men was the most certain harbinger of death, took place in a great many children who recovered.

Causes.—These have been a fruitful topic of discussion; both as regards their nature, and the mode in which they occasion the dissemination of the disease. That it is an endemico-epidemic,—that is, induced by a union of local emanations with a favouring condition of the atmosphere,—is now scarcely doubted. Of the precise nature of these emanations we know nothing. Our ignorance is as complete as it is on the nature of the emanations that give rise to intermittents. That the malaria is always paludal, as was maintained by some, (*Bancroft,*) is disproved by the circumstance, that it prevails to a great extent, where no marshes exist. Terrestrial emanations are probably requisite for its production, but that these are induced by animal or vegetable putrefaction or dissolution is by no means proved. It is necessary, also, for the disengagement of these emanations, that there should be a certain elevation of temperature. It has been affirmed, indeed, (*Sir Gilbert Blane,*) that yellow fever never occurs either in tropical or temperate latitudes, unless the temperature has been for some time steadily at or above 80°. This circumstance, indeed, with the difficulty of assigning any particular animal or vegetable origin to the disease, has induced some to consider that it may be engendered by solar heat alone; but the overwhelming objection to this view is, that there are numerous places, in which the summer and autumnal temperature is much higher than that stated above, where yellow fever is totally unknown. A recent writer (*Shapter*) admits, that it is difficult to state decidedly what are the local causes which produce it; but that they are most probably atmospherical; and, he adds, “as the disease is found only to occur in or near the sea-shore; most probably a climate which is modified by the sea forms a necessary condition.”

This error had been stated and refuted years ago. “It is certainly,” said a pathological writer, (*George Gregory,*) “a singular circumstance in the history of the yellow fever, that it has never prevailed to any extent at a distance from the sea, nor, except in a few instances, but on the shores of the Atlantic ocean.” The experience of the United States is altogether counter to this assertion. The disease has prevailed in as malignant a degree two thousand

miles from the Atlantic, as it has done in the West Indies or elsewhere. Its malignity has been fearful at Natchez, Gallipolis, and many other places, (*Prof. Potter*, of Baltimore;) and a fever, unquestionably of this character, has prevailed within the last two years far in the interior of some of the southern states.

One of the most satisfactory evidences of the local origin of our occasional visitant—the epidemic yellow fever—is the fact, that it has prevailed in this city, (Philadelphia,) as elsewhere, in certain parts of the town only, to which it could be confined by appropriate barricades. These were on the wharves and in the streets nearest the river.

Yellow fever occasionally breaks out and spreads on ship-board in hot climates, and the cause of this has, likewise, been a fruitful source of discussion. Thus far, it is beyond our knowledge, but here, as in all cases, we must presume that there is atmospheric vitiation.

The most important question, inasmuch as it strikes at the very root of the vexatious quarantine regulations, provided it be answered in the affirmative, is, whether yellow fever be capable of being communicated, or be generally communicated, by contagion. It appears strange to us, that any eminent individual could be found to maintain the views, that the disease is contagious, after the ample evidence to the contrary, that has been furnished even in this city. “No reasonable doubt,” observes an intelligent writer, (*Dr. Geo. Gregory*,) “can surely be entertained by any candid, intelligent, unbiassed man, that this disease, being once received into a town, is contagious. The evidence in favour of this opinion is certainly as strong as for that of the contagion of typhus or of plague.” Another writer (*Stevens*),—who maintains, that the disease is at all times essentially and absolutely the result of contagion, that it differs entirely from endemic fever, never proceeds from, and never passes into it,—remarks, that in the African typhus—as he terms the yellow fever—we must either shut our eyes against the most positive evidence, or admit that contagion is its sole cause. The proofs, which he has witnessed, are, to his mind, quite as strong as those in favour of the contagious character of either smallpox, scarlatina, or any other disease acknowledged to be contagious.

Others, again, have believed, that the same causes, which produce endemic fever, may, by the superaddition of a contagious property, generated in the subjects of the disease, give rise to another form propagated only by contagion.

The evidence against these views, afforded by the visitations of epidemic fever in the United States, is absolutely overwhelming. (*Professor Eberle*, of Cincinnati, *Professor Potter*, of Baltimore.) They have been well summed up by an intelligent investigator. (*Chervin*.) In the *first* place, although it has been the constant practice of the inhabitants of towns in the United States, to fly to the country as soon as the disease appears, and for those who are attacked to be carried to the homes of their families, in no instance

has the yellow fever been propagated out of the towns. *Secondly*, The city hospitals, that were established in the vicinity of Philadelphia and at New York, furnished a signal refutation of the supposed contagious nature of the disease; for, in no instance, was it communicated to those who were employed about the sick; and similar observations were made at the encampment near Baltimore, during the prevalence of yellow fever in that city in 1819. From these and other facts, Dr. Chervin properly concludes, that in hospitals devoted to yellow fever patients, the attendants of every class have been invariably exempt from the disease, when these establishments were situate beyond the source of the sickness, and the attendants did not expose themselves to it. *Thirdly*, That although, according to the hypothesis of contagion, it might be imagined, that persons, frequently approaching patients within the range of infection, are more liable to contract the disease, than those at a distance, and not communicating with them, yet this is not the case. *Fourthly*, That in fact the nearest communication with the bodies of the diseased, inoculating with the blood of persons so affected, drinking the black vomit, &c. has not propagated the disease. *Fifthly*, That the apparel, used by patients, has appeared to be equally inoffensive as their persons and corpses; and that separation and seclusion of the healthy from the sick, and the prohibition of all intercourse, direct or indirect, has entirely failed in preventing its occurrence.

It has been correctly, indeed, remarked, that if yellow fever did possess the power of generating its own virus, and of communicating itself by contagion, the fact must have been proved ten thousand times by the most irrefragable testimony; and yet there is, perhaps, no incontestable case on record where the disease was thus communicated. (*Professor Eberle*, of Cincinnati.)

It cannot be doubted, that yellow fever may be introduced into a port in ships, which, under certain inappreciable circumstances—as before remarked—may generate a malaria, that, under favourable conditions may engender the disease; and that this malaria may even be powerful enough to affect men who visit the vessel, or are on the wharves within a certain distance. The disease will not, however, prevail out of the region of the vitiated atmosphere. It will be restricted to those who come within the malarious sphere, and it will altogether disappear, when the ship and cargo are removed to a distance. The ship *Ten Brothers*, which arrived at Boston in 1819, affords an illustrative example, both of the production of malaria on board ship, and of its noncontagious nature. This vessel having arrived at Boston on the first of August, a number of persons went on board, whilst she was discharging her cargo, and of these twelve individuals, living in various parts of the city, were seized with malignant fever, nearly all of whom died. The disease was not, however, communicated to a single one of those who visited the sick. (*Professor Eberle*.)

The observation of almost all has seemed to show, that the

immunity from second attacks of yellow fever is nearly complete, and that it forms one of the most striking characteristics of this remarkable disease. (*Geo. Gregory.*) This would appear, in the main, to be the opinion of practitioners on this side the Atlantic, notwithstanding the affirmation, "that in countries uniformly hot, the disease is seldom observed to occur more than once in the same subject; but in all countries where the winters are cold, we find very little difference in the susceptibility to the cause." (*Professor Potter, of Baltimore.*) Dr. Potter adds—"The emigrants from St. Domingo were exempt from the yellow fever of 1797 and 1810 in this city (Baltimore); but in 1819, 1821, they suffered as much, *cæteris paribus*, as any other variety of the human species. I have remarked in my notes of 1821, that since 1793, I have attended more than a *hundred* persons in a second attack, *twenty-one* in a third, *seven* in a fourth, *three* in a fifth, and *one* in the eighth attack of yellow fever."

To have met with so many cases of the recurrence of a disease, which is usually considered—here, as elsewhere—to render the individual in a great degree unsusceptible of another attack, (*Professor Eberle, of Cincinnati, Professor Hosack, of New York,*) Dr. Potter's opportunities for observation must have been unusually numerous. They differ, too, not only from the results obtained by many of his own countrymen, but by the commission of thirteen medical gentlemen, British, French, and Spanish, who at Gibraltar, in 1828, were appointed to examine the important question—"Does a first attack of yellow fever preserve from a second?" Of this commission, M. Louis was appointed president; M. Trousseau, secretary; and Dr. Barry, vice-president.

The question was examined by them in a two-fold point of view. *First*, Whether an individual, who has had the yellow fever in Europe, is susceptible of a second attack of the same disease in Europe? And *secondly*, If one, who had had the disease in Europe, could have it a second time in America, and conversely? Every precaution was taken by the commission to avoid all supposable sources of error, and the conclusion was deduced from an accurate detail of circumstances and calculations. Their conclusion was—that second attacks are more rare in the case of yellow fever than of smallpox itself; that an individual once attacked, even in the slightest degree, is, with very rare exceptions, for ever exempt from future attacks; and that this is true, not only where the first attack and second exposure have taken place in Europe, but where the attack and exposure have been in different continents.

Hence, the important corollaries;—that persons, who have already had yellow fever, may remain without risk in a town where it is prevailing epidemically, as did the inhabitants of Gibraltar; and that the care of the sick should be, as much as possible, entrusted to those who have already experienced an attack; and the commission remark, that the same fact ought to have a great influence

in the selection of troops for colonies where yellow fever prevails habitually. (*Pym, Louis.*)

It was remarked, likewise, that the preservative influence of a first attack of yellow fever is not destroyed after a considerable lapse of time—twenty-four years for example; since the inhabitants of Gibraltar, who had passed through the yellow fever in 1804, were preserved from it in 1828, as effectually as those who had been attacked by it in 1815. (*Louis.*)

Amongst the predisponent causes of the disease, where it is endemic, must be reckoned the removal from a healthy situation to the locality where the disease prevails:—hence it attacks especially the unacclimated. A similar result occurs when the disease prevails epidemically.

Attacks are, likewise, favoured by intemperance, by excessive exposure to solar heat, to the damp and cool air of the night, and by whatever is calculated either to reduce the tone of the general system or to cause irregularity of action in any of the important organs.

A modern writer (*Mackintosh*) affirms, that many cases have come under his observation, in which fatal attacks of fever appeared to have been produced by inattention to the bowels; and he expresses his conviction, that it is a matter of the first importance to every one going to a warm climate, to keep his bowels open by gentle medicine. “Repeated observation,”—he adds,—“has induced me to believe, that a person may very often be exposed to any or all the causes of fever, even in the most unhealthy situations, without being affected, provided his bowels be in a proper state, his mind free from apprehension, and his habits good.”

Pathological characters.—Numerous opportunities have presented themselves for the necroscopic examination of yellow fever subjects. The appearances of course vary as in other febrile affections, but still some are met with, that appear to be characteristic of certain epidemics, if not of all. Of these, the most striking would appear to be the morbid alterations of the liver, which has been found pulpy, soft, very yellow, and easily broken down; its structure, at times, completely destroyed; and, by some, it has been described as resembling rotten cork. The spleen, too, has been found altered in a similar manner.

The stomach and bowels usually contain more or less of the dark coloured matter that was vomited during life; and the mucous membrane has been found vascular, of a deep red colour, not in depending portions only, but over a great extent of surface. (*Mackintosh, Professor Eberle, of Cincinnati, Professor Jackson, of Philadelphia.*)

In the yellow fever of Philadelphia, of 1820, the liver was found to vary in appearance, never constantly presenting the same aspect. It was usually gorged with blood, but not always. The gall-bladder was sometimes distended with bile, which was of the

colour and consistence of tar. The spleen and pancreas were usually natural. (*Professor Jackson*, of Philadelphia.)

It is stated, on the authority of another distinguished observer of this country, (*Professor Physick*), that the liver was rarely found much diseased; but the stomach was always inflamed, and gangrenous in parts.

In the yellow fever of Gibraltar of 1828, the greatest care was taken in the necroscopic examinations. The lesions, met with, were divisible into two classes,—some of them peculiar or almost exclusively peculiar, to subjects dying of yellow fever; others common to those subjects and to such as have died of other acute diseases. The red or black matter found in the alimentary canal, and the remarkable alterations of the liver described below, being of the first class; all other lesions of the second.

The red or black matter of the stomach and intestines not having been found in all the cases of yellow fever, it could not, of course, be esteemed an anatomical character of the disease. The alteration of the liver was, however, more or less, exactly the same in all cases; and, for this reason, it was considered as the essential anatomical character of the yellow fever of Gibraltar of 1828. (*Shattuck's Louis*.)

Two cases were, indeed, given to the commission, as instances of yellow fever, in which this diagnostic lesion did not exist, but it was clearly shown, that they were not cases of the epidemic. The alteration of the liver consisted in a discoloration,—the organ being sometimes of the colour of fresh butter, sometimes of a straw colour; at others of the colour of coffee and milk; at others of a yellowish gum or a mustard colour; and lastly, at times, of an orange or pistachio colour. This discoloration was not the same through the whole liver. It was more marked, and also more uniform, in the left than in the right lobe. In cases in which the colour was uniform in the left lobe, there was, in the right lobe, a mixture of gum yellow, orange or red points of different sizes; or else a rosy tint, which did not exist in the left lobe. Along with this discoloration, there was a marked paleness and a diminished quantity of blood, so that wherever this appearance of the liver was marked, the sections of it were dry in the left lobe. The appearance reminded the observers, at first, of the greasy or fatty transformation of the liver, which is always, however, accompanied by more or less softening. In these cases, the cohesion of the liver was not at all diminished, even when the organ was of a clear coffee and milk, or of a straw yellow colour, or of the colour of sole leather. In several other cases, indeed, the consistence of the organ was augmented.

M. Louis considers, that in the present state of our knowledge, it is impossible to determine the nature of this alteration or its cause. The anæmic state of the liver was the more remarkable, as no other viscus was found in the same condition, and many, as the lungs and stomach, contained a greater quantity of blood than

usual. He does not regard it as the product of inflammation; for, in almost all cases, the organ preserved its ordinary size; its firmness was as great as usual, and it contained less blood than in its natural state—characters, which, he justly remarks, are the reverse of those of inflammation, especially of acute inflammation, as this might be supposed to be.

It cannot, M. Louis thinks, be attributed to hemorrhage from the intestinal canal, as this did not take place in the cases where the hepatic lesion was met with; and, for the like reason, it could not be referred to a derivation produced by the inflammation of the mucous membrane of the stomach or duodenum. All his observations induced him to consider the commencement of the hepatic lesion to be synchronous with that of the disease, or that it occurs shortly after it;—that the liver is the only organ constantly, and more or less uniformly, altered in the subjects who died of the yellow fever of Gibraltar, whose bodies were examined; and that as this alteration is not found in persons dying of other diseases, it must necessarily be considered the anatomical character of the yellow fever. This character, the commission thought to be so much the more worthy of their attention, as, in the cases where no black matter was found in the stomach and intestines, there was no other means of distinguishing the bodies from those of individuals who had died of other acute diseases. (*Louis.*)

From the necroscopic examinations of the Gibraltar fever, M. Louis concludes, that it was not a gastritis; that the different lesions of the mucous membrane of the stomach were secondary or accessory, and that in cases where they were met with, they were probably developed at a certain period after the commencement of the disease. He is of opinion, however, that the disease had a particular influence on the development of gastritis, since it was more frequent, and came on nearer the commencement of the principal disease, with which, in some cases, it would appear to be confounded, than in any other acute affection.

Except in one case, in which some of Peyer's patches near the cæcum were slightly tumefied, there was no affection of the glands of Brunner and Peyer in the Gibraltar epidemic. (*Louis.*)

In the yellow fever of Texas, although functional derangement, suspension of the biliary secretion, existed uniformly, the anæmic condition, and light colour of the liver, were found in three cases only out of seven, (*Ashbel Smith;*) yet recent researches into the yellow fever of the West Indies, (*Rufz,*) are confirmatory of the results obtained by M. Louis; and a single case, which very recently fell under the care of a zealous pupil of that gentleman, who is one of the physicians to the Pennsylvania Hospital, (*Stewardson,* of Philadelphia,) led to a similar inference. The following interesting conclusions are drawn by Dr. Stewardson, in regard to the similarities and discrepancies, which exist between the morbid appearances observed by M. Louis in yellow fever, and those observed by Dr. Stewardson in remittent fever, and which were

briefly referred to under the last head:—"In both, the organs contained in the cavities of the chest and cranium were found either entirely healthy, or the seat only of such secondary changes as are common to many acute affections, if we except the frequent occurrence in yellow fever of certain blackish spots or masses in the lungs, dependent in great measure upon the exhalation of blood into their tissue, and also the frequent destruction of the epidermis of the œsophagus in the same disease. In both, the liver was in every case, the seat of a peculiar alteration, having certain common characters, but strikingly different in the two diseases. In both, the stomach was, in the great majority of cases, inflamed, whilst the remainder of the intestinal canal, the mesenteric glands and kidneys were healthy, or nearly so. On the other hand, we find no less striking differences. Thus, in yellow fever, the liver without much alteration of size or consistence, was yellow, anæmic, with but little bile in the gall-bladder, whilst in remittent it was generally enlarged and flabby, and always of a dark colour more or less resembling bronze, with a gall-bladder for the most part fully distended. In yellow fever the stomach, or some part of the intestinal canal, mostly contained a fluid black matter which was absent in remittent. The spleen in yellow fever was healthy or nearly so, whilst in remittent it was the seat of extreme softening and enlargement. A consideration of these three points of difference seems to me to be of the last importance in determining the question of whether yellow and bilious remitting fevers are distinct diseases. That they are so is now, perhaps, the most generally received opinion, derived from a comparison not merely of the difference of symptoms, but of the circumstances of their origin and prevalence, and if to these we add the differences in the post mortem appearances above mentioned, scarcely a doubt, I think, can be entertained but that this opinion is correct. The enlargement and softening of the spleen in the bilious remitting and other types of fever originating from marsh miasmata, is a prominent fact attested by most writers who have investigated the pathological appearances of disease in warm climates; and this fact alone is almost sufficient to convince us that yellow fever, in which the spleen rarely presents any considerable traces of disease, must be essentially distinct in its nature and origin. The very opposite conditions of the liver and of the biliary secretion are worthy of especial attention, in reference to the present question, especially as the increase of this secretion in the one disease, and its diminution in the other, are severally characteristic of them throughout their whole course, as shown by an appeal to symptoms."

It may be a question, whether the anæmic condition of the liver applies to all epidemics of yellow fever. In that of Philadelphia of 1820, it is said to have rarely presented the same aspect, but to have been usually gorged with blood, and the whole system of the vena portæ distended with blood, which remained fluid for several hours after death, when contained in the vessels, but when re-

moved from them, immediately coagulated. (*Prof. Jackson*, of Philadelphia.) This is not, however, peculiar to yellow fever. The author had recently an anomalous case in which the blood of the encephalic vessels flowed freely fifteen hours after positive death, and coagulated in the skull cap into which it was received.

It is proper, also, to remark, that in the yellow fever of Galveston, the glands of Peyer and Brunner were sometimes greatly developed. (*Ashbel Smith*, of Texas.)

In regard to the nature and origin of the black vomit, or of the matter thrown from the stomach in the latter period of yellow fever, great diversity of sentiment has existed. On its first appearance, it has a turbid reddish-brown aspect, is insipid and perfectly inodorous, and settles to the bottom of any fluid with which it may have been mixed in the stomach. It presents an appearance not unlike that of coffee-grounds, and is so mingled with mucus as to be ropy, and glutinous to the feel. Sometimes it is intermixed with small streaks of blood. From examinations instituted in this city (Philadelphia) in 1798-9, it was demonstrated very satisfactorily, that the black vomit proceeds solely from the stomach. (*Professor Physick*, of Philadelphia.) It was properly regarded by Dr. Physick, as a diseased secretion from the vessels of the stomach. Owing, however, to the great turgescence of the portal system usually met with, it has been suggested, that the hyperæmia and inflammation may be the result of this turgescence, and may be venous, and that black vomit may arise from a sanguineous effusion from the capillary extremities of the veins. (*Professor Jackson*, of Philadelphia.)

The red or black matter, found in the stomachs of those who died of the Gibraltar fever of 1828, varied in quantity from four to twenty ounces, and the deeper the colour the more abundant it was. The red matter was not usually of less consistence than the black, which presented much variety in this respect, being as thick as porridge in a great many cases, and very liquid in others. On standing, it separated into two parts—the upper more liquid and of a bistre colour; the lower, less abundant; and formed, as it were, of blackish parcels. The black matter was not mixed with clots of blood in any case, and was only once found in the stomach along with the red liquid. It was hardly doubted, that the black matter, when homogeneous, thick—pultaceous as it were—was partly at least composed of blood; the vessel in which it was kept and the bodies plunged in it being stained red. The precise mode of its formation must, however, remain in doubt. (*Louis*.)

The yellow hue of the skin has likewise been a topic of examination, and of diversity of opinion. Generally, it has been supposed to be owing to the bile, or, in other words, to be of an icteric character, depending upon the deposition of bilious matter under the cuticle. (*Professor Eberle*, of Cincinnati.) It is by no means proved, however, that such is the fact, and that it may not be owing to an altered condition of the blood, which is supposed by

some (*Stevens*) to be the cause of yellow fever, as of the more severe remittents already described. The morbid condition of the blood Dr. Stevens regards as the first link in the chain of phenomena, for as it circulates, it acts perniciously on every fibre, and on every tissue; disturbs every function of the body, and deranges every faculty of the mind, whilst all the excretions have a morbid appearance, and the several fluids are changed both in quality and quantity. (*Shapter.*) This is the explanation which Dr. Stevens gives of all remittent fevers.

Treatment.—The management of yellow fever has given occasion to as much controversy as the nature of the disease; and the fact would appear to be, that it is an affection of so much malignity,—especially when it first appears in any locality,—as to set all the efforts of art at defiance, and to occasion the mortality to be terrific. But little can be added to what was said of the treatment of malignant remittent fever. All the inculcations and cautions that apply to it apply equally to epidemic yellow fever.

In the epidemic fever of Gibraltar, to which allusion has so often been made, the practice, adopted by the medical staff of the British army, bore no resemblance to that of the private practitioners of Gibraltar. The former employed, at the beginning of the epidemic, large and repeated general bleedings, but they soon modified this practice, and subsequently used general bleedings only as an auxiliary to cathartics, and large doses of calomel;—these latter remedies, and, with some practitioners, mercurial frictions, constituting the main treatment. The mortality, resulting from the disease under this plan, was one in four and a half. The Spanish physicians employed bleeding very moderately, and only at the commencement of the disease; opened the bowels by gentle laxatives, or, in the advanced stage by enemata alone, and gave mercury only in a few very severe cases. The mortality by this plan was only one in six,—a proportion, which led the population of Gibraltar to consider the Spanish physicians to be much more successful than the British.

It is affirmed, however, that the difference was more apparent than real. All the patients, treated by the military surgeons, were—with few exceptions—robust subjects and in the vigour of life, having attained their 22d year. The male patients in the city, on the other hand, were, as a class, less robust than the soldiers, and a large part of the civic patients was composed of women and children. Now, it was found, that strength and vigour of constitution appeared to be unfavourable to recovery,—the ratio of mortality among children, as elsewhere remarked, being one in seven, that of females, one in five and a half, and that of males one in four and a half. In comparing, therefore, the mortality of two classes of patients, these circumstances must be taken into account. (*Louis.*)

Still, the management of the Spanish physicians would appear to have been judicious, and, equally favourable with the more heroic practice of the British army practitioners.

It is not many years since the mixed bleeding, and mercurial treatment was so universal, that no other course was ventured upon. Under the new views of pathology, of which Broussais was the renovator, if not the parent, a more soothing and less active system than the one usually employed was adopted by some of the practitioners of the south in their endemic yellow fever, and the results were satisfactory. (*Professor Barton*, of Louisiana.)

The condition of the liver, which is considered to be the "anatomical character" of yellow fever, and seems to commence with the earliest symptoms, is, unfortunately, inappreciable, and, in the existing state of science, not tangible by our therapeutical agencies. "The discovery of the remedy must be left to time and chance, and to the acuteness of the observer, for experience has sufficiently proved, that no dependence is to be placed on mercurial preparations of any sort." (*Louis*.)

Within the last few years much attention has been paid in Louisiana to the effect of large doses of quinia in yellow fever,—not administered during a period of remission, but in the very incipency of the disease, whilst the morbid action is forming, and before any local lesions have occurred,—for example, within six or eight hours immediately after the appearance of the earliest symptoms. The medicine was exhibited in one very large dose of from 20 to 60 or 80 grains, and it is said to have acted almost like a charm. When taken under such circumstances, its first effects are said to be:—a very slight increase of the febrile symptoms; the pulse is perhaps quickened; the respiration more hurried, and the usual signs of excitement are present. This condition is, however, but transient, and is promptly followed by corresponding depression. All the more violent symptoms subside; the temperature of the surface is lowered; pain is diminished; the pulse is gentle and subdued, and the skin covered with a healthy moisture;—in short, the chain of morbid associations is broken; sleep is induced, from which the patient awakes refreshed and substantially better; and, within 24 or 36 hours, he is considered in a state of convalescence.

Under the view, embraced by one West India practitioner, (*Stevens*), which has been already referred to,—that yellow fever is dependent upon an altered condition of the blood, in which there is a deficiency of saline matters—he administers saline medicines freely. When these agents—that are not purgative—the chlorate of potassa, for example—are employed, they do not, he says, irritate the stomach; they act upon the intestines as much as is necessary; keep up all the secretions, particularly that of the kidneys, and enough is absorbed to enter the circulation, prevent the dissolution of the blood, and preserve it until all fever abates, and the danger is past.

This plan, it need scarcely be said, is intended to be soothing and unirritating, which, after all, is generally the best system—as we have seen—that can be adopted in all the forms of remittent fever.

4. *Hectic Fever.*

SYNON. Febris hectica, Epanetus hectica, Hectica, Amphimerina hectica, Febris lenta, F. phthisica, Hectopyra, Hecticopyra; *Fr.* Fièvre hectique, F. étique; *Ger.* Zehrfieber, Schleichende Fieber, Abzehrungsieber.

This form of remittent fever is best known as one of the concomitants of pulmonary consumption. It is not, however, peculiar to that disease, but occurs wherever there is extensive suppuration, or serious derangement of structure or function persisting for any great length of time. Thus, it exists in tuberculosis of the lungs, when it has proceeded to the state of softening; and in diabetes, where there is no important structural derangement; but a very extensive modification not only in the functions of the kidney but of the whole system of nutrition. Hence, the extreme emaciation which always attends it, and which has probably given origin to its name, (from *ἐσθίω*, "I consume,") although it is generally considered to be derived from *ἔξις*, "habit of body," or *ἑστιασμός*, "habitual."

Hectic fever may be regarded as in all cases symptomatic, but as it occurs in diseases of very different organs, it requires a distinct consideration.

Diagnosis.—Hectic fever rarely presents itself unless where there have been previous signs of considerable structural or functional derangement; hence, it is always attended with great and progressively increasing debility. At first, it is generally obscure; but uncertain chills are experienced, which are followed by febrile flushings and exacerbations; the pulse being usually very frequent, varying between 90 and 120; and always extremely excitable, so as to be rendered more frequent under the application of very slight exciting causes. These exacerbations are accompanied by a burning sensation in the palms of the hands, and the soles of the feet; and they are readily induced by slight causes of excitation, as by meals, especially by breakfast. The most marked increase is usually in the evening; at which time, the face is observed to be suffused with a circumscribed flush, which has been called the "hectic flush" or "glow." At this period, there may be more or less disturbance of the digestive function, as indicated by want of appetite, foulness of tongue, and constipation of the bowels; but, frequently, the general sensations are little affected, with the exception of the sense of debility, which becomes gradually more and more considerable.

As the disease, which gave occasion to the hectic, becomes more and more developed, the exacerbations become more continuous, until, at length, the patient is rarely free from febrile movement: marked exacerbations, however, occur once or twice in the course of the day, and usually at about the same period; the most severe taking place in the evening, which attains its height about midnight, and passes off, by sweating, early in the morning. Often, however, the evening exacerbation, in true hectic, is scarcely indicated to the patient by more than heat in the palms of the hands

and soles of the feet, and by the copious sweatings which take place in the morning, and are termed night sweats: the medical observer does not fail, however, to detect the hectic flush and the other functional phenomena, which indicate the existence of this fever.

It was the opinion of a distinguished observer, (*Cullen*), that another paroxysm in the forenoon is an essential character of hectic. To this he was probably led by the idea, which he, and many others, entertained, that the healthy circulation is subject to a double diurnal excitement. From observations, since made, it would seem, that independently of incidental excitement, there is but one diurnal revolution. (*Knox*.) Dr. Knox found, that the pulse is more frequent and excitable in the morning on waking; that it gradually becomes less so towards evening; and that its greatest state of depression is about midnight or before going to sleep. These observations have been repeated, (*Christison*), but instead of finding actual excitement of the pulse in the morning, Dr. Christison found only very marked excitability. Under a careful avoidance of all accidental stimuli, such as food, exercise, mental excitation and the like, he discovered no difference whatever either in the pulse or animal heat, in the course of the whole day and night; but, on awaking in the morning, the excitability was so great, that trifling stimuli raised the pulse and temperature considerably; after midday, this excitability gradually decreased, and, towards midnight, it was lower than at any previous period. It is remarkable, therefore, that the ordinary period of greatest excitement in hectic fever, continued fever, and many other febrile diseases, occurs precisely at the time when there is the least excitement or excitability in the healthy state of the functions. (*Christison*.)

When hectic fever is fully developed, it is a true remittent; the patient, between the exacerbations, giving evident signs of the presence of fever; but, frequently, the apyrexia is so complete, that it has been mistaken, and treated for intermittent. Of this occurrence the author has met with numerous examples. In the majority of cases, there is no distinct chill, however, but the hot and sweating stages are distinctly marked.

In long protracted hectic, the functions of the digestive canal, which had been disturbed at first, are subsequently performed with greater vigour than many others; but, at a late period of the disease, the mucous membrane frequently exhibits evidences of inflammatory action; that of the mouth becomes aphthous: the stomach is, at times, irritable, and a colliquative diarrhœa is the result, if not of ileitis, of inflammation of some portion of the inner coat of the intestines. This—as stated under another head—occurs usually when the disease, which gave rise to the hectic, is about to terminate fatally; but it is not essential to hectic, and, indeed, in that, which accompanies pulmonary consumption, is far from being always present.

At this advanced period, there is usually a pale exanguious condition of the whole of the cutaneous surface, a pearly appearance of the white of the eye, blanching and incurvation of the nails; and, during the exacerbation, the face has the remarkably circumscribed and characteristic flush.

In the augmenting debility, the legs are apt to become more or less œdematous, as in other protracted diseases, accompanied by great emaciation. The intellectual faculties generally remain unimpaired until towards the close of the disease, and it is affirmed, that the sexual desires are rather augmented. In every form of hectic, not accompanied by severe bodily suffering, the patient is commonly unaware of the nature of his situation, and buoys himself with hopes of recovery almost to the last; laying plans, in many instances, for the future, on the very day that terminates his existence.

Usually, the disease persists for a long period, dependent of course upon the less intensity of the lesion that causes it; but, at times, it is frightfully severe and rapid,—in those cases of phthisis, for example, which are commonly known by the name “galloping consumption.”

Causes.—Unquestionably, hectic fever is most frequently observed along with organic diseases that are accompanied with the secretion of pus, as in pulmonary consumption, purulent effusions from chronic pleuritis; lumbar abscess, &c. &c. It has often been observed, that where large collections of purulent matter have formed, and been discharged by the surgeon, febrile irritation, of the kind in question, has rapidly supervened; yet little or no irritation may have been present before the matter was evacuated, and when it could have been readily taken up by the venous or lymphatic absorbents. It was, accordingly, supposed, at one time, universally, that the irritative or hectic fever is the result of the debility induced by the discharge of the pus. It is obvious, however, that from the time the pus was secreted, it must have been as extraneous to the vital operations as after its discharge. The removal of that which was already separated from the sphere of the vital actions could not add to the existing debility. The true cause of the hectic, set up in such cases, and present to some extent from the moment that extensive suppuration begins to be established, would seem to lie in the circumstance, that when once the pus is discharged, a recuperative effort takes place in the vessels of nutrition of the inner paries of the cavity, and the severe irritative fever, which ensues, is owing to the constitution sympathizing with the irritated capillaries, and to such an extent, that the system too often sinks under the effects of its own reparatory exertions. No one, at the present day, believes, that the consumptive are worn away by the purulent discharge that takes place from the substance of the lungs. Hectic fever supervenes in this case, as in every other, where extensive mischief exists, and great recuperative effort has

to be exerted, and under the daily irritation of this fever, the spark is gradually extinguished.

As before observed, the existence of suppuration is not essential to the production of hectic. The author has seen it in cases of diabetes where there was no material organic disease of the kidney perceptible on dissection; and it accompanies chronic pleurisy and pneumonia, where there is no reason to suspect the existence of pus, and where, indeed, its absence has been subsequently proved on dissection. In a case of chronic pleurisy, the fluid in the chest was evacuated by puncture, in the confident expectation that purulent matter would be discharged: but the only fluid that issued was a serum of light density, in which fleecy strings formed on standing. (*Christison.*)

Treatment.—It is not necessary to say much on this head, as the treatment proper for hectic fever is detailed under other heads, and especially under that of Tubercular consumption. Some general remarks may not, however, be inappropriate. It need scarcely be said, that depending, as it does, upon disease affecting some part of the economy, the main treatment must consist in due attention to the primary malady.

Hectic fever is not commonly so active as to require the vigorous employment of antiphlogistics. It can rarely be necessary to have recourse to blood-letting; and for the additional reason, that it usually accompanies morbid states, that require rather a corroborating than a reducing system of management. Where the skin, however, is steadily hot and dry, cathartics, given occasionally, with the use of ice, and of cold or tepid ablution to the arms and face, will be found to temper the morbid heat, and in this manner diminish the extent of the sweating stage. During this stage, the quantity of bed-clothes should be diminished so far as not to induce chilliness. On no account ought the perspiration—which is always more or less colliquative—to be encouraged. It is not necessary, however, to dwell upon the management of the colliquative sweats and diarrhœa, as they have been detailed at some length under the disease already referred to. In all cases, it need scarcely be said, where these and other symptoms arise in the course of a disease, the pathological condition that gives occasion to them must be inquired into, and be combated where practicable. Unfortunately, in the present case, that pathological condition is too often irremediable; and the phenomena themselves have to be regarded as a part of the affection. Still, in the case of the diarrhœa of phthisis, by investigating the cause, we discover that there is more or less endo-enteritis, which may be combated by appropriate management, but generally with the result only of palliation, the disease proceeding not the less surely and steadily towards a fatal termination. “There is no case,” says a pathological writer, (*Mackintosh*), “in which the difference is so strikingly shown between routine practice and that which is directed by sound pathological views. The routine practitioner will be invariably found to treat some of the symptoms

thus: Has the patient no appetite? Give him a tonic.—Is he purged? Prescribe an astringent.—Is he griped? Give him an opiate.—Is the urine scanty? He must have a diuretic.—Has he profuse perspirations? Let acid drops be exhibited!”

Opiates, in these cases, are generally valuable remedies. They allay irritation, and, at the same time, smooth the pillow of affliction, favouring a euthanasia, which the humane physician is ever anxious to promote.

SECTION III.

CONTINUED FEVER.

SYNON. *Febris continua*, *F. continens*, *Enecia*, *Febris continua continens*; *Fr.* *Fièvre continue*, *F. continente*; *Ger.* *Anhaltendes Fieber*.

It was before observed, that the existence of continued fever has been denied; and that, in all cases, perhaps, exacerbations may be noticed, in the course of the twenty-four hours, or, in other words, that there are daily remissions; but, certainly, there are fevers in which these changes are by no means marked, and where the patient experiences an increase of the febrile symptoms from accidental causes merely. Cullen's definition of continued fever was—"Fevers, without intermission, and without being produced by marsh miasmata, but with remissions and exacerbations, though not always considerable, continuing; two paroxysms in each day." This definition of Cullen has been followed by others: thus, we have *Enecia* or continued fever, defined as "one series of increase and decrease, with a tendency to exacerbation and remission, for the most part appearing twice every twenty-four hours," (*Good*;) whilst *Epanetus* or remittent fever is defined to be "strikingly exacerbating and remitting, but without intermission; one paroxysm every twenty-four hours."

The division, adopted by Cullen, of continued fevers into synocha or inflammatory fever, typhus or fever of prostration, and synochus which holds an intermediate position, although arbitrary, has been followed by many; but it is by no means sufficient; and although there is some plausibility in the affirmation of a distinguished writer of this country, (*Professor Rush*, of Philadelphia,) that it is "not more improper to say, that men are of different species, because some are tall and others short, or because some are long and others short lived, than that fevers are of different species, because they vary in their symptoms and duration," there is, nevertheless, not only convenience but philosophy in considering continued fever under a few distinct heads; for example, simple continued fever, typhus, typhoid fever, and plague: future examination may, indeed, prove, that the first and third of these, at least, are varieties of the same affection—the typhoid. (*Louis*.)

1. *Simple Continued Fever.*

SYNON. *Febris continua simplex, F. continens simplex.*

Diagnosis.—Continued fever commences usually in the same manner as the remittent form. Commonly, there is more or less chilliness in the first instance; and, occasionally, at intervals until the fever becomes fully formed. To the chilliness succeed the ordinary symptoms of pyrexia, which continue for a longer or shorter period; at times, when the disease has been induced and kept up by accidental causes, for a short period, as in ephemera; but at others, for a longer time; having, in such cases, a definite duration,—a circumstance, which has always to be borne in mind—and a tendency to terminate in health, instead of in debility and death, as was at one time supposed. (*Cullen.*)

The symptoms of simple continued fever are essentially the same, no matter what may be the duration of the disease, but they may vary materially in intensity, being sometimes highly inflammatory; whilst, at others, the phenomena denoting prostration of the powers may be more prominent. There are no evidences, however, of hyperæmia of any important organ, unless the disease should lose its simple character; and, indeed, the only danger that is to be apprehended, in cases of this form of continued fever, is the supervention of such hyperæmia. In all cases, the functions of innervation, circulation and secretion are in a morbid condition, but, with the exception of this condition, the actions of the general economy do not exhibit any very marked derangement, so that the disease may pass through its whole course without any necessity arising for a treatment directed towards any particular internal viscus.

The termination in health is always to be expected in the simple uncomplicated form of continued fever. There are cases, indeed, in which the patient would appear to have been worn out by the febrile irritation, and, under such circumstances, no distinctive pathological appearances may present themselves on dissection; but these cases are necessarily rare, for death does not often happen in this disease under any circumstance. The most common cause of a fatal termination is here—as in cases of remittent fever—hyperæmia or congestion of some internal organ. Owing to the activity of the circulation, and probably, also, to the modified qualities of the blood, (*Duhamel, Chaussier,*) engorgement easily takes place in the capillaries of some organ, and this hyperæmic state passes readily, under the circumstances, into inflammation, which may become the cause of death; and as it almost always happens, that the capillaries of some particular organ or tissue are more liable at the time to take on a morbid condition, we may thus, as has been suggested, (*Dubois d'Amiens,*) justify to a certain extent the expressions, *Febris pleuretica, Febris pneumonica, &c.*, employed by the ancients.

It is not necessary, however, to repeat what has been said on the secondary symptoms of continued fever. They have already been

the subject of comment under the head of Remittent Fever, and what was said there applies equally here.

The symptoms, which indicate the existence of disease in the different viscera, must be known from the study of those diseases. They are but little modified by the existing fever.

Causes.—Vicissitudes of temperature are generally regarded as the most common cause of continued fever, and such is, doubtless, very often the case. As before remarked, it rarely happens, that all the functions are carried on so harmoniously at any one time, that some one is not more liable than another to become disordered; and when such a predisposition to disease exists on the application of an adequate exciting cause, local hyperæmia or inflammation may declare itself, if the predominance of morbid tendency exists in one organ; or the disease may be more general, if the morbid tendency is present in a number of organs. In this way, irregular applications of cold and moisture, and vicissitudes in the conditions of the atmosphere may give rise to continued fever.

It is a disease of the more temperate climes, in which those vicissitudes prevail; as severe remittent fever is more a disease of countries in which the atmospheric temperature, during the summer and autumn at least, is unusually elevated.

It would seem, too, that age affords a predisposition,—the greater number of deaths from continued fever having been found in the London Fever Hospital to occur between the ages of 15 and 20; next between 20 and 25; and after this age the susceptibility would appear to diminish progressively. It would seem, too, that at the time of life when the proclivity to continued fever is greatest, and the mortality from it likewise most considerable, the general mortality is least. (*Dubois d'Amiens.*) Of 500 cases, selected at the London Fever Hospital, the mortality was as follows:—

Under 10 years,	14
10 to 15	40
15 to 20	118
20 to 25	84
25 to 30	73
30 to 35	25
35 to 40	39
40 to 45	30
45 to 50	29
50 to 55	14
55 to 60	12
60 to 65	6
65 to 70	9
70 to 75	5
75 to 80	2

500

It is proper to remark, however, that according to the statistical

inquiries of one observer, (*A. S. Thomson*), the period of life during which the highest ratio of mortality occurs from fever is from 40 to 50.

It is not easy to appreciate, with any accuracy, the general causes of fever; but we may perhaps be justified in saying, that, under favourable predisposing influences in the organism itself, there is no morbid agent, capable of generating inflammation, that may not equally induce continued fever. The influence of locality in simple continued fever is not marked; but, wherever continued fever prevails epidemically, either in the typhoid or typhous forms, or accompanied by great and unusual tendency to local complications, associated influences probably exist, which partly owe their origin to the *constitutio aeris*—as Sydenham termed it—and partly to the condition of the locality. Thus, in districts, in which typhoid and typhus fever have never been known, and which have been celebrated for their general salubrity, devastating fevers sometimes arise; of which a striking example fell under the author's observation at the University of Virginia in the year 1829. Without any evident physical cause, the students of that institution were attacked with typhoid fever in the winter season, which proved fatal in several cases, prevailed for a few months, and disappeared, without the practicability of assigning—after the most scrutinizing investigation—anything like a plausible reason for either its origin or disappearance. But adequate physical causes, without doubt, existed in a form of combination that may not recur.

Under the other forms of continued fever remarks will be made upon impure air, malarious influence and contagion as causes: they can be rarely, if ever, concerned in the production of the simple form. It has been presumed, that moral emotions ought unquestionably to be ranked as causes, and in impressible individuals, under the favouring circumstances before alluded to, it can be understood, that continued fever may be generated in this manner; but the event is probably very rare. When epidemic fever prevails in a community, the depressing passions may certainly be concerned in the etiology. The effect of these on the different functions is, to render the system more susceptible of the morbid influence, and, consequently, in all epidemic visitations, a serene and cheerful mind is one of the best prophylactics. This, and this only, would appear to be the cause, why the physician, more than any other persons in the community, escapes those diseases. His mind is occupied; his functions are exerted energetically, and he withstands morbid influences, which might develop the disease in others less favourably circumstanced.

Pathological characters.—In the existing state of our knowledge, it can scarcely be said, that simple continued fever has any distinct pathological characters. It is rare—as before observed—for persons to die of it; and, consequently, but few opportunities arise for making the necessary examinations.

If the patient dies simply from febrile irritation, there may be no evidences of disease. If from the supervention of some organic lesion, it will be detected. So much, however, that applies equally to continued fever, was said on this subject under the head of Remittent Fever, that it is unnecessary to repeat it here.

Treatment.—The same remarks are in many respects applicable to the treatment also. The great general principles of management are, indeed, the same in all fevers.

At the commencement of an attack of simple continued fever, or of fever, which may, or may not, assume the continued form, if there be reason to believe, that it is owing to the presence of aliment improper by quantity or quality in the stomach or intestines, it is important to administer an emetic, and to follow it up by an ordinary cathartic; after which, if the affection be merely ephemeral, the patient—under confinement to bed and restriction to slop-diet—may be entirely restored in the course of a day or two.

Should epidemic fever prevail, there is no probability, that this treatment will cut short the disease, which will usually run its course in spite of every effort to arrest its progress.

The sentiments of excellent authorities have differed much in regard to the practicability of cutting short continued fever; whilst one (*Elliotson*) speaks of it as a frequent occurrence, others think it occasionally happens, (*Bright, Addison*;) whilst others, again, regard it as so rare, that the hope of it cannot be made a foundation for rational treatment. (*Geo. Gregory*.) It may obviously be difficult to say, in such cases, whether the fever that appears to be cut short would have been continued, if the measures had not been applied, or whether it might not be a case of simple ephemera. Certain it is, however, that the cutting short of continued fever must be looked upon as an extremely unfrequent occurrence.

With the view of arresting the fever, it has been advised to administer a nauseating emetic, or to draw blood, or to adopt both plans at the same time; but when they are employed, it must be rather in consequence of special symptoms that indicate their use.

In the mildest cases, which are altogether uncomplicated, it is but necessary, that the patient should be confined to bed, be put upon farinaceous or unirritating diet, with the occasional employment of refrigerants and mild cathartics; but if much synochal or inflammatory excitement prevails, it may be advisable to take away blood, partly with the view of moderating the febrile action, and partly, also, to prevent the occurrence of hyperæmia, or of inflammation. It must be borne in mind, however, that continued fever is a disease, which has a tendency to run a definite course, and, when uncomplicated, to terminate in health; blood should not, therefore, be drawn with the view of overpowering the fever, which is impracticable, but of moderating increased vascular activity; and care should be taken, in its repetition, lest the powers of the system be so far reduced by it, that under the resulting nervous

impressibility, liability to hyperæmia in some important organ may arise, or the symptoms assume the adynamic form.

General blood-letting is rarely admissible, except in the first week of fevers, unless some organic complication should arise; and even then, in the majority of cases, greater advantage will accrue from the judicious application of cups or leeches.

Throughout the whole course of the disease, the bowels, as in other febrile affections, should be kept open by mild cathartics daily. The perturbing system, animadverted upon under another head, is scarcely less objectionable in continued fever than in the remittent; but the retention of morbid secretions must be carefully avoided, in the early periods of the disease, by the use of any of the ordinary cathartics; and, in the latter periods, if judged proper, by enemata. In simple continued fever, the coëxistence of gastro-enteritis, notwithstanding the assertions of the writers of the school of Broussais, is not common; and, consequently, less evil might result from the employment of therapeutical agents, which act specially upon that membrane; but their employment necessarily gives rise to much corporeal disturbance, which can scarcely fail to aggravate, rather than mitigate, the febrile disorder.

In the latter periods of continued fever, when the violence of febrile irritation has, in some measure, passed away, and the diseased actions appear to persist as it were from habit, revellents applied to the cutaneous surface exert at times a salutary effect, by localizing that which had been general, and concentrating the disordered actions towards one point,—and that an unimportant point,—of the economy. The practice—as elsewhere remarked, (*General Therapeutics*, p. 357,)—which is pursued by some therapeutists, of attempting to derive from every organ that is incommoded by the irregular afflux of blood during fever, by the application of an epispastic, whenever symptoms of such partial afflux present themselves, does not seem to be judicious. It is apt, in the early periods of fever, to keep up the irritation, and to add to the disordered movements, by the excitant irradiations, which blisters are known to induce, and which, in the opinion of some, (*Broussais*,) add to the intensity of gastro-enteric inflammation where it is present.

Under the tendency of the disease to run a definite course, and—unless disorganizing inflammation should supervene in some part of the organism—to terminate in health, the true method of management is to allay all irritations, wherever existent, as effectively as possible, and not to adopt any course, during the period of great excitement, which can augment them. But when the disordered movements have persisted until the period at which the disease ordinarily yields, and appear to be likely to be farther protracted, the application of revellents, which excite a new action in the system generally, or in some part of it, will frequently break the morbid chain and restore all to harmony. In this manner, probably, a blister often acts beneficially in such cases,—as well as mercury,

when carried so far as to affect the system, but short, if practicable, of inducing full salivation.

It is not always easy, however, to affect the mouth where much fever exists; and it has been maintained, that when we do succeed, it is an evidence, that the fever has abated, or is about to terminate,—not that the mercury has broken in upon the morbid association. “It would appear,” says a modern writer on fever, “that the febrile action forms a protecting power against the influence of mercury, as its action on the system does not take place till the fever subsides; hence, I always regard the early effect of mercury as a favourable circumstance in fever.” (*Tweedie.*)

In regard to the employment of refrigerants, and especially of ice, the same remarks are applicable as in remittent fever. It is one of our best febrifuges, and far superior to any agent in the class of reputed diaphoretics, all of which are extremely uncertain, and none of them other than indirect agents.

When the disease runs into the typhous state, it has to be met by those agents, which are appropriate to the condition, and which are inculcated under the next head.

2. Typhus.

SYNON. *Enecia typhus.*

Typhus fever has generally been regarded as a variety of continued fever, characterized by great disturbance of the mental faculties. It is usually indicated by a small, weak and unequal, but usually frequent pulse, with great prostration of strength, and cerebral disturbance. It is continued fever—in other words—accompanied with great cerebral irritation and prostration.

By almost all the older writers, typhus was divided into two varieties—*Typhus mitior* and *Typhus gravior*;—the first constituting the *Enecia typhus mitior*, *Typhus simplex*, *T. nervosus*, *Febris lenta nervosa*, *F. nervosa*, *F. putrida nervosa*, *F. hectica maligna nervosa*, *F. asthenica*, *F. adynamica*, *F. gastrica nervosa*, *F. continua nervosa*; Fr. *Fièvre nerveuse*; Ger. *Nervöse, typhöse, asthenische Fieber, Nervenfieber, Typhusfieber*; the “nervous fever” of most writers and of the people, and denoted by slight shiverings, heavy, vertiginous headache; great oppression; peculiar expression of anxiety; nausea, sighing, despondency, and coma or quiet delirium;—and the second constituting the *Enecia typhus gravior*, *Typhus carcerum*, *Febris putrida*, *F. continua maligna*, *F. continens putrida*, *F. typhodes*, *F. putrido-gastrica*, *F. nautica pestilentialis*, *F. carcerum et nosocomiorum*; Fr. *Fièvre des hôpitaux*, *F. des camps*, *F. des prisons*, *F. pétéchiale*; Ger. *Faulfieber, Faulige Fieber*; the *Putrid fever, Jail fever, Hospital fever, Petechial fever, Camp fever, Spotted fever*, and *Malignant fever, Malignant typhus, Eruptive typhus*; attended generally with rigors and heat alternating, with little or no perspiration; pulse tense and hard, usually quick, but fluttering; pain

over the forehead and vertex; delirium, succeeded by stupor; signs of incipient putrescency,—petechiæ, vibices, hemorrhages, &c.

Of late years, more especially, it has been attempted to be shown, that there are two distinct forms of fever, to one of which the epithet *typhoid* may be given; the other being the true *typhus*; and that these differ essentially from each other in their anatomical characters;—the typhoid fever being connected with, if not dependent on, an inflamed or ulcerated condition of the follicles of the intestines; whilst, in the true typhus, there is no lesion of these follicles; and the disease is contagious, whilst the other is not.

There is, however, great confusion amongst writers on this matter, which it is not easy to disperse; thus, a recent writer, (*Roupell*), considers an epidemic typhus, which he has described, to have been owing to a specific cause; as, when closely observed, it was found to pursue a definite course, passing through its stages with regularity, spreading by infection, and being marked in its progress by a distinctive rash. He, consequently, refers it to the genuine exanthemata of authors, the characteristics of which it possesses;—yet Dr. Roupell evidently describes the affection, to which many recent observers would apply the term *typhoid*, and which they regard as a distinct disease.

It is unfortunate, indeed, that the term *typhoid* should have been applied to any distinct form of disease, inasmuch as it has been generally employed to indicate a condition of prostration and encephalic disturbance, which may occur in many diseases, rather than to indicate any separate affection.

The same remarks apply to the word “typhus,” which has been used very indefinitely by medical writers; but, by the laity, the idea of a malignant contagious disease is always associated with it.

Diagnosis.—The symptoms, usually ascribed to typhus, are the following:—Commonly, there are distinct prodromic symptoms, similar to those that foretell the onset of other forms of fever—as prostration, or languor and lassitude, with a sense of general indisposition, troubled sleep, and more or less gastric disturbance. This latent period—as it may be termed—may last for a few hours, or for several days; and for some time after the application of the exciting cause or causes, there may be no functional disturbance whatever. In other cases, where a severe epidemic typhus prevails, the disease sets in without any evident prodromic phenomena.

At the very commencement of the disease, the symptoms may be inflammatory, so as to suggest the idea of synocha rather than of typhus; the pulse may be full and bounding, and the skin hot and dry; without, perhaps, much encephalic disturbance. The author has, indeed, found the thermometer rise as high in epidemic typhus, at the commencement, as in scarlatina. In several instances, it has marked 106° of Fahrenheit's scale.

This train of symptoms rarely continues beyond three or four days, when the symptoms of high febrile excitement diminish, and

those that particularly characterize typhus, and give it the name "nervous fever," set in,—as anxiety, restlessness, delirium, and tinnitus aurium. As in other forms of fever, already described, the symptoms are increased in violence towards evening, and, in the morning, there is usually more or less remission; and, as in almost all forms of continued fever, and still more in the remittent, there is frequently an augmentation of the morbid phenomena every other day, so that the patient has—to use the common expression—a better day and a worse.

Occasionally, even during the first days of the disease, the skin—which is commonly hot and dry—is bathed with a profuse perspiration, and these cases have been found, at times, to be extremely tedious. (*Stokes*.) Often, partial irregular sweats, of short duration, occur, which afford no alleviation to the symptoms. The bowels are generally constipated; and the countenance is of a dingy hue, flushed, and peculiarly expressive of great languor and oppression. The eyes are somewhat injected, watery and heavy, and the whole expression is considered so characteristic, as not to be easily mistaken by a practised observer.

Usually, about the end of the first week—sooner in some cases than in others—the typhous symptoms augment. There is more manifest stupor, and, at times, deafness, with frequent sighing, and brief and impatient replies, if the patient be questioned. The eyes are suffused and filled with tears; the nostrils obstructed by adhesive mucus; the lips dry and chapped, and the teeth and gums covered with dark sordes; the tongue brown, dry, and often, also, chapped, which, in part, prevents the patient from protruding it readily. The state of the tongue varies, however, materially, and cannot, perhaps, be regarded as a correct index of the condition of the intestinal canal, (*Stokes*,) although it may throw important light on the general state of the system. "You may have extensive disease," observes Dr. Stokes, "with a natural tongue, and you may have a morbid state of the tongue without any appreciable intestinal lesion. You will often see, in the advanced stage of fever, a red, dry and chapped tongue become pale, moist and smooth, under the use of wine, carbonate of ammonia, and other stimulants; and yet, in such cases, if you were to judge by the tongue alone, you would say, that there was inflammation of the intestines, and that the employment of stimulants was dangerous; and, indeed, if it was ordinary inflammation, we know that it would be exacerbated by stimulants."

Occasionally, in the course of typhus, but by no means so frequently as in typhoid fever, there is diarrhœa, with meteorism and tenderness on pressure; but, generally, there may be little or no abdominal complication of the kind.

As the disease advances, the prostration becomes more and more pronounced, the complexion more dingy, and the tongue darker and drier. The signs of enfeebled innervation are very marked. The patient lies upon his back, entirely listless and unable to prevent

himself from sinking down in the bed; the hands are affected with tremors, and the muscles with subsultus. When asked to protrude the tongue, he is incapable of doing so; or, if capable, cannot hold it steady. Usually, too, there is low muttering delirium or coma. The eye is dull and without expression, and the evacuations are passed involuntarily,—at first, only when asleep, but subsequently when awake. At this period, hemorrhage not uncommonly takes place from some of the outlets, accompanied or preceded, by petechiæ or vibices. Most frequently, the hemorrhage is from the bowels; but, occasionally, from the nose, stomach or urinary organs. Under these symptoms, the patient becomes more and more enfeebled, and, in fatal cases, death takes place, preceded by the functional phenomena noticed in all affections attended by great adynamia.

It can readily be understood, that the blood of a typhous patient may differ very materially from that of health, which may account for the associated purpuric and hemorrhagic conditions. It flows sluggishly from the vein, is of a very dark hue, coagulates loosely, and very rarely presents any buffy appearance. In the last stages of very severe cases, it coagulates so loosely as to almost resemble ill-made currant-jelly. (*Christison*.) Its chemical constitution is, likewise, materially changed, being much poorer in all its solid contents, but especially in the colouring matter, and saline materials. The salts and hæmotosine have, indeed, been found reduced to two-thirds of the healthy proportion. (*Clanny*.) In regard to the petechiæ, a question has arisen, whether they be really dependent upon this altered condition of the blood, and its transudation through the coats of the vessel, or, whether they may not be esteemed of an exanthematous character. When they occur at an early period of the disease, the latter view is, perhaps, applicable to them, inasmuch as there may be but little debility; but still they may have their origin in the modified condition of the fluid of the circulation. They would appear, however, in no case to be more than incidents in the course of the disease, and in no way to influence its progress. When they are found at an early period, and are red and small, they are by no means of as serious import as when they occur at a later period, are very dark coloured, large, and accompanied with hemorrhage from some outlet. Under such circumstances, they are of unfavourable augury.

It has been a question with some observers, whether typhus ought not to be classed amongst the exanthematous fevers; but the generality of pathologists are not disposed to place it amongst the true eruptive fevers. A recent writer (*West*) who commenced his investigations with a strong prepossession in favour of the opposite view is of the negative opinion, and the chief facts on which he bases his conclusions are the following: *First*, The disease often occurs more than once during the lifetime of an individual. *Secondly*, The eruption is not invariably present. *Thirdly*, The eruption does not always present the same character, nor does it always

run a regular course, observing definite periods of increase, acme and decline. *Fourthly*, The type of the fever itself varies, being sometimes intermittent, sometimes continued, changing from the one to the other form, and being occasionally converted into other diseases. It may be questioned, however, whether many of these cases were not rather remittent fever, depending upon malarious influence, than typhus.

Typhus fever rarely terminates in health before the end of the second week; and, at times, it goes on much longer, sometimes for weeks. In one epidemic, the author met with a large number of cases, which persisted for five or six weeks. The ancients were of opinion, that a turn or crisis of the disease, as of every form of continued fever, is occasioned by, or connected with, some discharge, as diarrhœa, epistaxis, increase of urinary secretion or copious diaphoresis, which were consequently termed "critical." The idea, however, of critical discharges or efforts of nature, is not now embraced by many, in the ancient acceptation at least. The ideas, indeed, that are attached to the expressions, are sufficiently imprecise. If a diarrhœa should supervene near the favourable termination of a protracted fever, it is looked upon as critical; but if the same condition supervene in phthisis pulmonalis, and prove colliquative, we hear nothing of its being "an effort of nature," or of its constituting a crisis. Yet, although we may discard the idea of critical efforts of nature, it cannot be doubted, that good occasionally results from spontaneous discharges; and that, at other times, their supervention indicates a change in functions that had been long disordered, and a restoration to the healthy condition. Thus, diarrhœa or perspiration supervening in a fever of some duration, in which the organs of secretion have been deranged—as they always must be in fever—may indicate that the organs of secretion are assuming a new condition, and that the morbid association, previously existing, is beginning to disappear. (See the author's *General Therapeutics*, p. 14.)

The ancients believed, that certain days were "critical," or, in other words, that a more favourable termination is more likely to take place in fever on some days than on others. But few modern practitioners put any faith in the doctrine of critical days, and the author is satisfied, from his own observation, that it is entitled to little or no consideration. It is proper, however, to remark, that the results of an extended series of observations in the epidemic typhus, at Edinburgh in 1819, (*Welsh*), are somewhat in favour of the views of our forefathers on this head. According to Hippocrates and Galen, the greatest number of fevers terminate favourably on the 7th day, and many on the 14th,—these two days being the most propitious. Next to these come, in order of efficacy, the 9th, 11th, 20th or 21st; 17th, 5th, 4th, 3d; 18th, 27th, and 28th. The sixth day was, the tyrant, τυραννος, (*Galen*), because the crises, that happened then, were generally unfavourable. After this, the most unfavourable were the 8th, 10th, 12th, 16th, and

19th. The 13th was a sort of neutral day;—the crisis, which happened on it, being neither favourable nor unfavourable. Days were also divided into *intercalary*, in which the crises occurred less frequently, and were less complete than on the *critical* and *indicatory*; and into *vacant* and *non-decretory*, in which a crisis hardly ever occurred. According to this division, they were enumerated as follows:—*Critical days*, 7th, 14th, 20th, 27th, 34th, 40th, 60th, &c. *Indicatory days*, 4th, 11th, 17th, 24th, &c. *Intercalary days*, 3d, 5th, 6th, 9th, &c. *Non-decretory days*, 2d, 8th, 10th, 12th, 13th, &c. Fortunate crises were considered to be indicated by favourable signs appearing three days before.

It would be strange if all this apparent exactness were well founded. The following table exhibits the results obtained by Dr. Welsh; but, although it has been considered to show, “that the ancient physicians were correct in admitting the doctrine of critical days, (*Christison*,) it appears to us to exhibit so much irregularity in the matter, that nothing certain can be deduced from it; and the results of other observers would necessarily exhibit great discrepancy, inasmuch as but few would agree upon the precise day on which the disease exhibited “a decided tendency to terminate.” (*Christison*.) By comparing the critical days of the ancients, as given above, with those on which Dr. Welsh noted “a decided tendency to terminate,” it will be seen, that except in the case of one or two of them there was no striking coincidence.

The data on which the following table is founded—it is proper to observe—were drawn from three types of fever taken promiscuously, and at a time when synocha and synochus were very common.

Days.			Days.		
Critical.	Non-critical.	Cases.	Critical.	Non-critical.	Cases.
3	—	6	14	—	63
4	4	18	15	—	10
5	—	80	16	—	11
6	6	34	17	—	34
7	—	129	18	—	2
8	—	26	19	—	4
9	—	80	20	—	0
10	—	17	21	—	15
11	—	69	22	—	3
12	—	80	23	—	0
13	—	15			

The specification of the critical and non-critical days, it will be observed differs materially from that of Hippocrates and Galen, and most of the ancients.

The more recent researches of another observer, (*Davidson*,) are by no means in favour of this doctrine of days; but they show very strikingly, that there is a great tendency in the disease to run its course in from two to three weeks. Convalescence, in the following table, means the time when the patient was actually free of the febrile symptoms, namely, “when his pulse was natural,

his tongue pretty clean; his sleep tolerably sound, and his appetite moderately good."

Table showing the day of the disease on which complete convalescence was established in 181 cases of eruptive typhus.

MALES.		FEMALES.	
Day of disease.	No. of cases.	Day of disease.	No. of cases.
12th	1	13	2
13	4	14	7
14	2	15	11
15	9	16	3
16	9	17	9
17	9	18	10
18	6	19	6
19	7	20	10
20	3	21	3
21	10	22	5
22	8	23	2
23	2	24	3
24	6	25	1
25	2	27	4
26	4	28	1
27	4	29	3
28	1	30	2
29	3	32	1
	—	34	4
	90	36	1
		44	1
		54	2
		— Total,	
		91—181.	

Average convalescence in males, 19.7 days.

— females, 21.3

— in males and females, 20.5

Causes.—It has been an oft-agitated, and still unsettled, question, whether continued fever—and especially typhus—be communicable from one person to another. Whilst some are of opinion, that all the forms of primary continued fever are communicable, and probably in an equal degree, (*Christison*), others believe, that typhus alone can be so conveyed, and that one of the distinctions between the typhoid and the typhus fevers of certain of the writers of the present day consists in the latter being communicable by infection, whilst the other is not; and, lastly, there are some, who stoutly maintain, that the lowest forms of typhus cannot be conveyed from one person to another. A late writer affirms, that in the British Islands probably not above one physician in fifty entertains any doubt of the infectious nature or communicability of continued fever, (*Christison*); and he adds, that in France, and, also in Germany, on the contrary, the opposite doctrine is at the present time prevalently adopted, though not by so preponderating a majority. This last remark may, however, be doubted, as we are informed on high authority, (*Chomel*), that, in France, the majority of physicians are opposed to the doctrine of infection, and

that not above one in two hundred considers, that typhus is capable of being propagated in this manner.

Under the head of the causes of yellow fever, the difficulty of deciding whether an endemico-epidemic fever is at the same time communicable,—or rather, whether the spread of the disease be owing to endemico-epidemic influences or to contagion was alluded to, and evidence was there afforded to show, that there was no sufficient reason for the belief that yellow fever is a communicable disease. The evidence, however, which was wanting in that case, exists in that of the disease now under consideration.

The annals of this, as well as of other countries, record the existence of adynamic fevers, which could not easily have been propagated in special cases except by contagion; for example, the fevers to which judges, jurymen, and others in attendance on courts of law, have fallen victims, and which appear to have been conveyed by prisoners from the jails. Many of these “black assizes,” as they have been termed, have occurred in England;—the last in the year 1750, which was described by a distinguished physician of the time, (*Sir John Pringle.*) It is true, that the spread of the disease in court has been ascribed, in these cases, to impure air, brought by the prisoners from their dungeons; and if it be not admitted, that impurity of air can generate the disease, it is unquestionable, that its spread is favoured by this circumstance. Typhus is, indeed, essentially a disease of large cities, and of the most filthy and crowded portions of such cities. In London, in certain districts, in which the poorer classes are densely congregated in small ill-ventilated chambers, when typhus appears, it spreads with frightful rapidity, sparing neither the young nor the old, the male nor the female; and yet, at the same time, in the better ventilated dwellings of the higher classes, the disease may not exist; or, if it should, its propagation from one to another is scarcely ever observed. (*Tweedie.*) The writer, just quoted, adds:—“The fact, that the effluvia or exhalations from the human body, not only in disease, but in a state of health, may, by concentration, become so virulent as to produce fever, should be strongly impressed not only on the minds of medical practitioners, but on all those who are more immediately interested in improving the condition of the poor. Sir John Pringle states, that he has observed the hospitals of an army, not only when crowded with sick, but at any time when the air is confined, and especially in hot weather, produce fever of a peculiar kind, which is often mortal; and he remarked that the same thing arose in full and crowded barracks, and in transport ships, when filled beyond a due number, and detained long by contrary winds, or when the men had been long kept at sea under close hatches, in stormy weather. Similar illustrations are to be found in the writings of army and navy physicians. The late Mr. John Pearson, who took great interest in establishing and promoting the interests of the fever hospital, told me, that when he was surgeon of the Lock Hospital, he uniformly observed, when

more than a certain number of patients were placed in any of the wards, fever became prevalent in the establishment; and that from repeated observation of this fact, he was induced to restrict the number of beds in each ward, and never afterwards witnessed the recurrence of fever in the house."

In cases of camp fever, it has been repeatedly observed, that when the camp was broken up, and the sick separated into different parties, the fever totally disappeared, although the patients might be exposed to bad weather and the jolting of carriages. (*Stokes.*)

Under the impression, that putrid emanations of any kind, received into the blood-vessels of a healthy individual, might induce adynamic symptoms,—*Typhohémie*, (*Piorry*,)—experiments have been instituted by several distinguished pathologists. These experiments have shown, that all the phenomena of typhus can, in this way, be produced in the lower animals. Putrid substances have been injected into the veins of animals, and applied to the surface of wounds; and, in every case, the animals became ill, had languor, loss of appetite, thirst,—all the symptoms, indeed, of typhus, and, where they died, local lesions were found corresponding with those observed in the human subject in typhus. (*Gaspard* and *Magen-die*.)

In these cases, it was observed, that the greater and the more concentrated the dose of the putrid poison, the greater was the resemblance of the consequent fever to typhus.

In certain experiments, that were instituted by another pathologist, (*Gendrin*,) he ascertained, that healthy human blood occasions no injury when thrown into the veins of animals. He then injected the blood of persons labouring under various specific fevers, and found that a fatal result ensued, and that similar consequences followed its application to the cellular tissue. An ounce of blood, drawn from a person labouring under putrid fever, was injected into the cellular membrane of the groin of a cat; copious vomiting, dyspnœa, with a small, frequent, irregular pulse, a dry brown tongue, great prostration, and slight convulsion followed, and death took place in seven hours.

It would appear, consequently, that adynamic fever may be induced by the reception into the vessels of putrid matters, without there being a necessity for supposing, in all cases, the transmission of a contagious virus; but still, ample evidence exists, that the extension of typhus fever, when it prevails epidemically, is by communication from individual to individual.

It has been properly remarked, that our chief reasoning must be founded on the facts, observed when persons in health approach those who are infected, or when disease appears in a healthy situation immediately upon the arrival of an infected person. (*Roupell*.)

During the prevalence of typhus, it has been found, that they who have attended upon the sick—as the nurses and medical practitioners—have been great sufferers. This has been the fact in all

well observed epidemics. At St. Bartholomew's Hospital in London, during one session, six pupils were attacked, and about as many during the one immediately preceding; and, amongst the nurses, infection was almost universal. The reply here—as in all similar cases—is, that these persons may have been in the very locality that gave rise to the disease; and, therefore, that the causes, being common, may have induced the affection in all. Numberless instances, however, it is affirmed, presented themselves, in which the fever appeared indisputably to be conveyed by the sick. (*Roupell.*)

The London Fever Hospital affords signal evidence of the communicability of typhus. It is affirmed by an accurate writer, (*Tweedie,*) that every physician with one exception, (the late Dr. Bateman,) who has been connected with it, has been attacked with fever during his attendance, and that three out of eight physicians have died. “The resident medical officers, matrons, porters, laundresses, and domestic servants, not connected with the wards, and every female, who has ever performed the duties of a nurse, have one and all been invariably the subjects of fever; and to show, that the disease may be engendered by fomites in clothing, the laundresses, whose duty it is to wash the patients' clothes, are so invariably and frequently attacked with fever, that few women will undertake this loathsome and frequently disgusting duty.

“The present resident medical officer,” Dr. Tweedie adds—“was attacked with fever, and it was necessary, in consequence, to appoint some one to perform his duties during his illness. The first person who officiated for him resided constantly in the house during the day, but took the precaution of sleeping at home. He was, of course, very much exposed in the wards, in the performance of his duties. These, however, were soon interrupted by an attack of fever, which confined him for a considerable time. The duties were then undertaken by a medical pupil, who had completed his education, and entered the hospital in the most robust health. He had been taught, and did implicitly believe in, the non-contagious nature of fever, and ridiculed the idea of any personal danger from residing in the hospital. He performed the duty of house-surgeon for ten days only, when symptoms of a severe fever appeared. Unwilling to believe that he had caught the disease, he ascribed his illness to the effects of common cold, till the febrile prostration, and severe determination to the head, obliged him to resign his duties. He was, within twenty-four hours, seized with most severe symptoms of cerebral fever, which required the abstraction of nearly one hundred ounces of blood before they were subdued. He passed through a most dangerous attack of fever, and remained in the hospital five weeks, before he could with safety be removed; though I fear this almost fatal personal illustration has not convinced him of the contagious nature of fever.”

To meet the argument, that the prevalence of the disease among

the medical attendants and domestics of the London Fever Hospital is owing to its being surrounded by malaria, as has been advanced by some,—it may be remarked that the Smallpox Hospital is situate within a few yards of it, and that if malaria were the cause, the medical officers and domestics of that hospital ought equally to suffer from fever; yet it would appear from the evidence of the physician to that institution (*Geo. Gregory*,) that no case of genuine fever had occurred amongst them for the previous eight years. (*Tweedie*.)

Similar evidence of communication has been afforded in our own hospitals during the prevalence of typhus. In an epidemic typhus, which prevailed at the Philadelphia Hospital, and which has been described by one of the author's colleagues in that charity (*Gerhard*, of Philadelphia), three of the principal nurses, and about a dozen assistant nurses, besides a number of patients ill with various diseases, were attacked with the fever. Only one nurse of a ward, in which many of the patients were collected, escaped; and several of his assistants and patients were taken ill. Two of the resident physicians, who were in attendance on the ward in which the patients were most numerous, were also seriously ill with the fever. On the other hand, no nurse from the part of the hospital, where there were but few or no typhus cases suffered, and the number of patients, taken ill in the surgical or lunatic wards, was very small.

It has been a common belief, that the dead body of a typhous subject is capable of communicating the disease (*Morgagni*); but careful observation would seem to show, that this must be a rare occurrence. In an epidemic of unquestionably contagious fever, at St. Bartholomew's Hospital in London, seventeen bodies of those who had died of the fever were submitted to dissection. On an average, eight pupils were engaged upon each. There were one hundred and thirty-six thus occupied. Six of the whole body of students were attacked with fever, but of these six, two only devoted their time to dissection; and these two had been moreover exposed to the infection of the living body in the wards of the hospital; the other four were in close and constant attendance on the patients, as they were acting at the period of their seizure as clinical clerks. (*Roupell*). Such also was the result of observation at the Philadelphia Hospital. Both Dr. Gerhard and Dr. Pen-nock, and several of the resident physicians were engaged nearly every day during the most intense prevalence of the disease, in making long and laborious anatomical investigations, without suffering from the fever. (*Gerhard*, of Philadelphia.)

Granting, then, that typhus is communicable, it is clear, that the poison is not very virulent, and that if due attention be paid to cleanliness and ventilation, and to avoiding prolonged exposure in the immediate vicinity of the patient, it may be rendered almost harmless, except in the cases of unusually susceptible persons. It has been well ascertained, in many severe epidemics, that where

fever has been communicated to an individual of the better classes of society, by attendance on the sick in hospitals or in the restricted—and too often filthy—habitations of the poor, it has been rarely propagated in his own family, to visitors or to any of his attendants. It is affirmed by a writer of experience in public and in private (*Christison*), that among numerous instances known to him of young practitioners and medical students, who have caught fever in the prosecution of their practical studies, not a single case has occurred, where the disease was communicated in their families at home, or in their lodging houses; and the experience of Dr. Christison is confirmed by that of the author, who has had numerous opportunities for witnessing epidemic typhus in the hospitals of Edinburgh, and in both hospital and private practice in London. These facts are important both in the way of hygiene and therapeutics.

It has been before remarked, that if prolonged exposure be avoided, the disease is not readily taken. This is shown by the fact, that casual visitors, whether of the medical profession or not, rarely take the disease. It is affirmed, indeed, that the common interval, in the case of clinical clerks and nurses, between their taking charge of fever patients for the first time and the breaking out of the disease, is three or four weeks; whilst, in the case of a second attack, the interval is about as many months. It would seem, indeed, that a second attack of true infectious fever scarcely ever takes place, except under repeated and long-continued exposure. (*Christison*.)

The idea of complete immunity, after one attack, is certainly not correct. Dr. Tweedie, physician to the London Fever Hospital, has had the disease three times; and Dr. Christison, physician to the Royal Infirmary of Edinburgh, six times.

Age would appear to offer a predisposition. Very young children are rarely attacked. In the asylum for children, attached to the Philadelphia Hospital, where there were above 200 on the occasion of the epidemic typhus, before referred to, none were taken ill. (*Gerhard*) After the period of childhood, the age seemed to be nearly without influence. Such was not, however, the case in the epidemic typhus, which prevailed at Glasgow in 1836. According to the data obtained there, (*Cowan*), it would seem, that if the chances of seizure between the ages of fifteen and twenty were 100; between twenty and thirty, it would be, in round numbers, 78; between thirty and forty, 49; between forty and fifty, 29; between fifty and sixty, 15, and above sixty $4\frac{1}{2}$. (*Christison*.)

But little influence appears to be exerted by sex; both sexes are equally liable to it.

Pathological characters.—There are no morbid appearances, which invariably present themselves in fatal cases of typhus. Were we to judge from one epidemic, we might be disposed to infer, that the disease is characterized by a certain set of morbid results; but, by taking a more general view, we are less disposed to adhere to

this opinion, and are led to give them a wider range. It has been maintained, that in true contagious typhus there is no dothinen-teritis or follicular gastro-enteritis, and such appears to have been the case in the epidemic which prevailed at Philadelphia in the spring and summer of 1836. In about fifty cases, there was but in one, and that was doubtful in its diagnosis, the slightest deviation from the natural appearance of the glands of Peyer. In all other cases, they were remarkably healthy, as well as the surrounding mucous membrane, which was much more free from vascular injection, than it is in cases of various diseases not originally affecting the small intestine. The mesenteric glands were always of the normal size. The spleen was of the natural appearance in one-half the cases; in the other half, it was softened, but not enlarged, and in one case in five or six, it was enlarged and softened. (*Gerhard*, of Philadelphia.)

These were the appearances of one epidemic, but as the lesions in question must be regarded as secondary, they may vary according to the character of the prevailing disease. Thus, in contagious typhus, which prevailed in Glasgow, dothinen-teritis or enlargement of the mucous follicles of the smaller intestines, and enlargement and ulceration of the aggregated glands of the lower third of the ileum, occurred in combination, and were found in about one in six of those who died of typhus. (*Perry*.)

The pathological appearances will, of course, differ materially according to the character of the symptoms; but, as in other cases of fever, the most careful examination may elicit nothing that is primary. Numbers of cases of true typhus—contagious typhus—have been investigated in London, where no marked morbid alteration of structure was to be seen, further than the signs of congestion in some of the internal organs—encephalon, or mucous membranes—or an immaterial serous effusion. (*Christison*.)

Treatment.—The management of typhus fever reposes on the same general principles as that of continued fever in general. When once the disease has become established, it is difficult—if not impracticable—to cut it short by any agency. The efforts of the practitioner are, consequently, restricted to tempering the morbid actions, and especially to the removal of any hyperæmia that may supervene in the internal organs. Not many years ago, the cold affusion was frequently employed with the view of cutting short this form of fever, (*Robt. Jackson, Currie*;) and the author had many opportunities for witnessing the plan in the wards of the Royal Infirmary of Edinburgh, at the time under the management of Dr. Home, the late excellent professor of Materia Medica in the university of that city. In none of these cases did the disease seem to be arrested; but the violence of the symptoms was occasionally mitigated by it. The same may be said of the employment of general blood-letting, and of emetics;—both frequently advised, with the view of cutting short continued fever; the latter especially, through the powerful revulsion which they excite, being

considered well adapted for breaking in upon the chain of morbid actions that constitute fever. In no case has the author observed this result; nor has he been satisfied, that the use of emetics has had much—if any—influence on the progress of the disease. When blood-letting is practised at all, it should be in the early period—at the very onset, if practicable; but in many epidemics it does not appear to be productive of advantage even then. These remarks, however, apply only to general blood-letting. Throughout the disease, should hyperæmia supervene in any internal organ, the application of cups or of leeches may be demanded; but not so much as depletory agents, as revellents.

Refrigerant remedies are extremely valuable in typhus; and the best of these is sponging with tepid or cool water, which may be practised with advantage whenever the skin is steadily hot and dry. The effect it produces is in the highest degree salutary; the temperant agency exerted on the part with which it is made to come in contact is speedily conveyed to every portion of the intermediate system of vessels; morbid heat is diminished, and even the encephalic symptoms have been moderated by it, especially when it was applied to the head.

The remarks that have been made in regard to the use of cathartics in other forms of continued fever, apply also to typhus. Although highly extolled in this, as well as numerous other diseases, their efficacy is more limited than has been conceived by many. Indiscriminate and repeated purging can scarcely fail to prove injurious in a disease of prostration—as typhus undoubtedly is, in its lowest forms and last stages. Yet, although repeated purging may be objectionable, the occasional use of a gentle cathartic, and, in the latter stages of the disease, of daily enemata, is all important. Where the excrementitious matters are allowed to accumulate in the bowels, they are the source of much reflected irritation, which can only be removed by the remedies under consideration.

As in other forms of fever, the most uncertain of all our classes of therapeutical agents—diaphoretics—are constantly employed; but observant practitioners, who admit the existence of such a class, have been compelled to express their doubts as to their efficacy. The grateful effervescing draught, the neutral mixture, and the solution of acetate of ammonia, were employed in the epidemic typhus of 1836; but the testimony adduced in their favour is feeble. “From the very nature of these remedies, it is difficult to ascertain if they possess much power over the disease: speaking of our general impressions, we should state, that they diminished the intensity of the fever, and concurred with the sponging in reducing the temperature. From these probable advantages, added to their freedom from deleterious properties, we employed them in a large majority of our cases.” (*Gerhard*, of Philadelphia.)

Our opinion of these agents has been already expressed: the two first are refrigerants, when administered at a proper tempera-

ture, and therefore diaphoretic, whilst the last is gently excitant, and applicable, perhaps, in certain stages of the disease; but their main utility is of a negative character. Something, it is conceived, must be administered; and they are as devoid of objection as any agents that could be employed.

In many stages of the disease, revellents are productive of excellent effects. In the early period, cupping with the scarificator may be used when signs of hyperæmia occur; but later on in the disease, when coma and injection of the eye supervene, dry cups to the nape of the neck or along the spine may be applied with marked advantage. Under similar circumstances, blisters are occasionally applied to the nape of the neck, but the inconveniences they induce are by no means counterbalanced, at all times, by their good effects. Sinapisms are not liable to the same objections, and they are obviously more appropriate when the patient is debilitated, with the skin cool, than under opposite circumstances. Stimulating liniments of various kinds,—for example, oil of turpentine, alone or associated with the decoction of cantharides, as in the *Linimentum Cantharidis* of the *Pharmacopœia* of the United States, have been much prescribed by some, in the period of prostration, and after the fever has subsided; but their therapeutical agency is limited. In cases of great prostration, all these revellents have been used as excitants, and especially blisters. The practice is more followed in this country than in Europe. It consists in applying blisters to the arms and legs, when the powers of life have become so far reduced that excitants seem to be clearly indicated. It has been affirmed, indeed, (*Professor Rush*, of Philadelphia,) that there is a period in fevers, a “blistering point,” when these agents may be used with eminent advantage. If the excitement be above the point, blisters are improper; if below, the contrary. The difficulty obviously must be great in fixing upon this point, if any such exist. Blisters are by no means advisable stimulants in fever. They excite great irritation, and the discharge induced by them cannot fail to augment the debility. As revellents, however, they are often of great advantage. When, for example, the disordered actions, constituting fever, have gone on for weeks without the existence of any considerable local mischief, the revulsive irritation, induced by epispastics, becomes a centre of fluxion, as it were, so that the mischief is localized, and the morbid chain broken in upon. Accordingly, in this way blisters may be used most advantageously in many febrile complaints; but care must be taken, that the irritation, induced by them, is not too intense so as to be reflected to every part of the system, and thus add to, rather than detract from, the disorder of functions.

In like manner, the revellent action of mercury is most beneficially exerted under the same morbid conditions and circumstances.

In the latter stages of the disease, tonics may be necessary; and, in many cases, their effect proves most salutary, when the force and frequency of the pulse have yielded, and the febrile heat is greatly

diminished. The different vegetable tonics have been given in such cases, in infusion, with the best effects: of these, the cold infusion of cinchona, acidulated or not, with sulphuric acid, is one of the best,¹ or the sulphate of quinia may be administered.²

¹ R.—Infus. cinch. ℥vss.
Syrup. aurant. ℥ij.
Acid. sulph. dil. gtt. xx.—M.

Dose, a fourth part, every six hours.

² R.—Quiniæ sulph. gr. vj—xii.
Acid. sulph. dil. gtt. xx.
Aquæ, ℥ivss.—M.

Dose, one-third, three times a day.

Sooner or later, too, it becomes advisable, in many cases, to employ agents that are more excitant. It has been the custom, with many, at all periods of typhus, to administer alcoholic drinks, when the symptoms appear to indicate it; but the objection to them is, that, unless skilfully regulated, they are apt to excite too much; and if any circumstance should interfere with their regular employment, the resulting depression—which is in a ratio with the preceding excitation—is apt to be considerable. It is better, therefore, to give wine, the action of which is more permanent and moderate, and, therefore, more easily regulated.

The quantity of wine may vary according to the case. If it be indicated at all, four ounces in the twenty-four hours is as small a quantity as can well be commenced with; to be increased, according to the judgment of the practitioner. It may be administered, mixed with an equal quantity of water, and sweetened, or in the form of whey, which is generally the most palatable. The disease has a tendency to run a definite course. If, therefore, we can support the system until the “most malignant influence” of typhus has passed away, (*Stokes*,) we may prolong existence until the natural and favourable termination of the disease arrives. “We do not allow our patients to die of exhaustion, and bearing in mind the depressing influence they struggle with, we give stimulants at the proper time, and with a bold hand. We give our patients an artificial life, until the period arrives when nature and health resume their sway.” (*Stokes*.)

It must be constantly borne in mind, however, that we can only act upon the excitability or the life already present in the system; and, by administering our excitants too freely, we may exhaust it long before the period of propitious termination referred to by Dr. Stokes.

When, under the use of wine, the febrile heat and the frequency of the pulse augment, wine is improper, and the prognosis often unfavourable.

Dr. Stokes has recently endeavoured to deduce from the state of the heart an additional rule of guidance for the inexperienced in the exhibition of wine in typhus.

Two opposite conditions of the heart may be observed in the disease: in the one, the impulse becomes extremely feeble or altogether wanting, whilst the sounds are greatly diminished in intensity; in the other, the heart's action and sounds continue vigorous through the whole course of the disease. These opposite states

are not necessarily revealed by the condition of the pulse or the warmth of the surface. We may observe a hot skin, whilst the action of the heart is almost imperceptible; and, on the other hand, a patient may be pulseless, cold and livid for days together, whilst the heart is acting with the greatest vigour. This condition of the heart has to be determined by auscultation over the infra-mammary and sternal regions, the pulse being an uncertain guide. (*Stokes.*)

The physical signs, above mentioned, are considered by Dr. Stokes to indicate a debilitated condition of the heart, which may even occur at an early period of the disease, and thus enable us to anticipate the symptoms of general debility; and, he infers from his observations, that their presence, in a case of maculated adynamic fever, may be considered as pointing out a softened state of the heart,—that this softening of the heart is one of the secondary local lesions of typhus; and, lastly, that the diminution or cessation of impulse, the proportionate diminution of both sounds, or the preponderance of the second sound, are direct and nearly certain indications for the use of wine in fever.

The common opinion is, that wine should not be allowed in fever, whilst the patient's eyes are red and suffused; but it has been properly remarked, (*Graves,*) that want of sleep will make the eyes red and suffused, and this, being very common in fever, it cannot be brought forward as an argument against the use of wine. Neither—adds Dr. Graves—does a hot skin contra-indicate the use of wine, particularly when there is, at the same time, a tendency to coldness of the extremities.

Wine, properly administered, is capable of fulfilling well our views in the latter stages of typhus. The objection to the use of the more diffusible stimulants, as the carbonate of ammonia, ether in its various forms of preparation, &c., is the same as that already made in regard to alcoholic drinks. They are not sufficiently permanent in their action, and consequently their effects must be transient. The carbonate of ammonia is a favourite remedy with many practitioners, but it has never been eminently effective in the experience of the author.

Much difference of opinion has existed in regard to the employment of opium in typhus. It is certainly a valuable agent in many cases, and is rarely found to prove injurious, notwithstanding the cautions inculcated, by many writers, in regard to it, who appear to have been led rather by hypothetical considerations than by the results of experience. It has been laid down,—that there are three circumstances, that call for the employment of opium in fever; first, where there is persistent watchfulness; secondly, where an actual inflammatory condition of the brain existed, and has been subdued by proper antiphlogistic treatment, but delirium and other nervous symptoms still remain; and lastly, where an excited state of innervation of the brain exists without heat of scalp, or remarkable throbbing of the arteries of the head. (*Stokes.*) Dr. Stokes adds,

that in all cases where the patient has been exposed to the depressing effects, which high intellectual or moral excitement, or the abuse of spirituous liquors produces on the nervous system, there will be, during the course of fever, more or less disorder of the sensorium; and that, in such case, particularly if the delirium exists independently of any affection of the blood-vessels, opium is the sheet-anchor,—beginning with a moderate dose, watching its effects, and repeating it in increased or diminished quantity according to circumstances.

It may be administered in the form of Dover's powder, (gr. x,) or of the tinctura opii, (gtt. xxxv;) or of the black drop, (gtt. xv;) or of the preparations of morphia. The sulphate, the acetate, or the muriate, (gr. $\frac{1}{6}$ — $\frac{1}{4}$,) may be given with this view. It has been affirmed to be obviously improper where there is much dulness of intellect, attended with great suffusion of the eyes and countenance, (*Gerhard*, of Philadelphia); yet, under these very circumstances, it is often given, and although without good effects in all cases,—for some are unfavourable, no matter what may be the course of treatment pursued—it has not appeared to the author either on pathological or therapeutical grounds obviously improper.

Camphor has long been given alone, or united with camphor, partly under the idea, that it is possessed of narcotic properties, and partly as an excitant to obviate debility. It is not trusted to, at the present day, by many, (*Christison*,) yet some have confidence in its powers. It is unquestionably excitant, and the author has not been able to observe any other action from it. By this property, it is, at times, advantageous, where there is low muttering delirium, with tremors and subsultus tendinum, both when given by the mouth, (gr. v, every two hours,) and in enema.

R.—Camphor. $\mathfrak{z}$ j.
Mucilag. acaciæ, $\mathfrak{z}$ j.
Aquæ Oss.—M.

The diet, throughout the disease, must be regulated upon general principles. In the early period, it may be sufficient to allow barley water; and, subsequently, milk with the feculaceous aliments,—arrow-root, sago, or tapioca. Where more nourishment is demanded, beef tea may be allowed, but this cannot be necessary until the active symptoms have passed away, and, the condition supervenes, which suggests the employment of wine, and of other tonics and excitants.

In the way of prophylaxis, it need scarcely be said, the patient should, if possible, be placed where ventilation is practicable; and hence, when the disease prevails in the crowded and ill ventilated habitations of the poorer classes in cities, it is important to send the sick to institutions that are adapted for the purpose, both with the view of preventing the spreading of the disease, and of affording the best prospects of cure.

When typhus fever appears epidemically, it is difficult to avoid its attack; yet much may be done by attention to cleanliness; to

thorough ventilation, and to appropriate diet, which ought to be nutritious but not excitant. When free ventilation is attended to, it is not necessary, that the family should be excluded from any communion with the sick; yet, as the disease is contagious, such communion ought not to be more frequent or prolonged than is indispensable. The bed-clothes should be often changed, and all unnecessary furniture, especially of woollen material, or of dark colour—for it has been found, that the darker colours attract more odours, and, therefore, probably more miasms than the lighter—should be removed. Fumigations of chlorine, prepared by adding dilute sulphuric acid to the chloride of lime, may also be employed; partly with the view of acting chemically upon the exhalations, and partly because they suggest and require subsequent ventilation; and it has been properly remarked, that the personal attendants, in the case of the poorer classes, where space and ventilation can scarcely ever be attained, should be strictly limited to those required for the patient's wants. (*Christison.*) The necessary precautions will readily suggest themselves to the medical practitioner. Where there is a *foyer* of infection, it must be deprived of its malignity, as far as practicable, by appropriate ventilation and fumigation—bearing in mind, in all cases, that the latter without the former does but deteriorate the air of the sick chamber more and more, and cannot fail, therefore, to prove injurious.

3. *Typhoid Fever.*

It was before observed, that the epithet *typhoid* has been applied to phenomena characterized by prostration with more or less stupor when occurring in the course of any disease, and hence the terms *typhoid pneumonia*, *typhoid pleurisy*, &c. &c. Typhoid fever, at one period, meant a febrile condition of a continued character having similar symptoms; and even at the present day, the mass of the profession employ the terms with these very significations. Of late years, however, typhoid fever has been considered, by many pathologists, to comprise a certain set of phenomena differing from typhus, and from the condition that supervenes in long protracted fevers, and to be identical with a very common febrile affection in France as well as in the British Islands, and not uncommon in this country.

This affection has already an extensive synonymy, although not many years have elapsed, since the views entertained in regard to it at the present day were first promulgated.

It has received the names of *Typhoid affection*, *Dothinenteria*, *Dotkinenteritis*, *Ileodichiditis*, *Follicular enteritis*, *Gastro-enteritis with nervous affection of the brain*, *Follicular gastro-enteritis*, *Abdominal typhus*, *Typhus ganglionaris abdominalis*, *Febris intestinalis ulcerosa*; Fr. *Fièvre typhoïde*, *Fièvre entéro-mésentérique*, *Exanthème intestinale*, *Entérite typhohémique*; Ger. *Sporadische Typhus*, *Nervöse gastro-enteritis*, *Unterleibstypus*, *Abdominalganglientypus*.

It is not more than thirty years since the anatomical characters of the typhoid fever, in its restricted signification, were first satisfactorily announced. In the year 1812 was published the treatise on entero-mesenteric fever, by MM. Petit and Serres; and the subsequent researches of MM. Broussais, Bretonneau, Louis, Bouillaud, Chomel and others have demonstrated, that the disease has anatomical characters, which are nearly constant, and functional lesions, which are almost always identical. (*Andral*.) The work of Louis on this affection is an imperishable monument of scrutinizing industry, and accurate discrimination worthy of all imitation.

It would appear, that the typhoid fever or follicular enteritis is one of the most frequent and the most severe acute affections observed at Paris; the various forms of the common continued fever occurring there being essential varieties of the same malady; and that it differs essentially from the typhus of England and of this country. It is likewise not uncommon in the United States, where it presents the same anatomical characters as in France. (*Gerhard*, of Philadelphia, *Professor James Jackson*, *Enoch Hale*, and *Shattuck, Junr.*, of Boston, *Professor Bartlett*, of Lexington, Ky.) As yet the British practitioners, generally, do not admit this new division of typhoid fever or follicular enteritis, and typhus: most of them are disposed to regard the intestinal affection as an accidental complication, occurring in ordinary typhus, and not as characterizing a separate disease. Nor do they agree with certain writers on this subject, that the follicular enteritis is non-contagious, whilst the typhus is readily communicable. The writers on the follicular enteritis do not, indeed, agree amongst themselves on this matter. Whilst some of them (*Bretonneau*, *Gendron*, *Putegnat*) believe the disease to be contagious, and bring forward many facts in proof thereof; others assert, that they have no evidence whatever of its communicability in this manner. The physicians of Paris accord with great unanimity on this point; and one of the most distinguished of them (*Andral*) remarks, that if the typhoid fever be contagious at Tours, where it was observed by Bretonneau, it certainly is not so at Paris. In this country, the opinion of observers, already cited, accords with that of the physicians of the French metropolis. Recently, however, M. Louis—with a degree of frankness that does him honour—believing that the contagious nature of typhoid fever is proved by facts, now admits it without hesitation. He considers it to be demonstrated, that typhoid fever may be communicated by contact with those labouring under the disease, by remaining near them, by means of the clothing they have used, and by contact with those that have attended upon them;—that the importation of the disease is often the origin of an epidemic, and that this latter is the effect and not the cause of the contagion; that the propagation of the disease depends upon the degree of intercourse maintained with the sick, and not upon the wretchedness or the unhealthiness of their habitations,—and that an isolated case of the disease may be the cause of its prevalence. M. Louis

thus abandons one of the marks, that have been regarded to be distinctive of typhoid fever, as contradistinguished from typhus; and his followers will, of course, adopt the example.

Diagnosis.—It is not necessary to repeat the ordinary symptoms, which indicate the existence of a febrile condition of the typhoid kind. It will be sufficient to point out the most important of the phenomena, which have been considered, in recent times, as forming a part of, or being connected with, follicular gastro-enteritis.

The intestinal affection is generally well-marked from an early period. Diarrhœa is one of the most constant phenomena, and occurs amongst the first;—at times, commencing before the other symptoms; at others occurring simultaneously; and being generally—but not always—in a ratio with the extent of disease in the follicles of the intestines. The diarrhœa would seem to be dependent upon the lesion of the mucous membrane.

Tympanitic distension or meteorism, has recently been regarded as of more importance than formerly, and as furnishing one of the distinctive marks of the disease. It certainly is found in a large proportion of cases. Of 197 cases of typhoid fever, it was recognized, either in direct terms, or by necessary implication, in 130. In 24, there was nothing to show, whether it was present or absent; and in 43, it is expressly said to have been wanting. (*Hale*, of Boston.) If all these, consequently, were really cases of typhoid fever, meteorism cannot be looked upon as a diagnostic symptom, since it was wanting in so many.

At times, the meteorism occasions a painful distension, the uneasiness being augmented by pressure; but at others, it is so slight as not to be distinctly recognized except by increased resonance on percussion. It is met with more especially, towards the termination of the disease, when, as in other febrile diseases, it is of unfavourable augury.

Enlargement of the spleen, perceptible during life, has been laid down as one of the pathognomonic signs. It may be felt below the ribs, or by pressing the fingers under the cartilages during a full inspiration. In many cases, however, it cannot be perceived even where examination after death shows it to be much enlarged. The spleen was felt in 19 cases; was not felt in 21; and was noted in the record in 157 cases. (*Hale*, of Boston.)

In the majority of cases, careful examination exhibits eruptions of the skin. Of these, the most frequent are the *taches rouges*, red or *rose spots*. Of the 197 analyzed cases, before referred to, rose spots are recorded in 177; and it is affirmed, that, in the remaining 20, sufficient attention does not appear to have been paid to render it by any means certain, that they did not exist.

In the majority of cases, these petechiæ—as they are termed by *Andral*—appear from the 8th to the 15th day. They present themselves most frequently on the lower and middle portions of the chest, and upper part of the abdomen.

The spots are generally of a round shape, and although they do not seem to project above the surface of the skin, they can be detected by passing the finger over them. Their colour is generally rose; and the more or less depth of colour has been regarded as indicating the greater or less severity of the affection. (*Andral*.) The number of the spots is likewise various. Sometimes not more than six or eight are perceptible; at others, the eruption is almost confluent. Their size, too, is equally various, but it rarely exceeds that of the head of a pin. The colour disappears when the spots are pressed upon by the finger, but returns immediately afterwards.

Sudamina have been mentioned as phenomena appertaining to the typhoid affection. These are small, colourless vesicles, generally occurring in great number, and found especially on the neck, the axillæ, and the groins. They are owing to the elevation of the epidermis by a small quantity of transparent serous fluid. According to some, they commonly appear from the 8th to the 12th day, (*Andral*;) but they are by no means constant, and, frequently, do not appear until the patient has become decidedly convalescent. Moreover, being of little importance in themselves, and giving rise to no sensation to attract attention, they are very apt to be overlooked. (*Hale*.) It is quite probable, however, that the sudamina have no particular connection with the typhoid affection: they are intimately connected with the actual or antecedent existence of prolonged sweats, without distinction of diseases, and their existence may often be affirmed from the presence of prolonged sweating. It would appear farther, from recent observations, that they are in a constant ratio with the sweats,—numerous when these have been copious, and rare under opposite circumstances; and that these relations are found to exist in the different regions of the body—the sudamina being abundant in the parts where the sweat accumulates, and conversely. (*Bouillaud*.)

From a comparison of typhoid fever with other diseases, with the view of determining whether the meteorism, enlargement of the spleen, rose spots, and sudamina, occurred equally in them, the following table was constructed:—(*Hale*.)

	TYPHOID FEVER.			OTHER ACUTE DISEASES.		
	No.	Cases.	Per cent.	No.	Cases.	Per cent.
Whole number,	-	-	-	197		159
Meteorism,	-	-	-	130	66	9
Spleen felt,	-	-	-	19	9	0
Rose spots,	-	-	-	177	90	0
Sudamina,	-	-	-	75	38	8

M. Andral enumerates the following as the principal circumstances that may lead to a certain diagnosis of this disease:—Youth, cephalalgia, diarrhœa, stupor, delirium, somnolency, petechiæ (rose spots), sudamina, epistaxis, intestinal hemorrhage, cough, tendency to the formation of sloughs or eschars, fuliginous character of the mouth, and meteorism. These he regards as characteristic symptoms.

The typhoid affection would appear to occur—as a general rule—

but once in a lifetime. It has generally, too, been considered to be almost peculiar to middle aged persons, and to be as rare in infancy as in old age; but this would not seem to be the fact. (*Valleix, Rilliet, Taupin.*) A recent writer has given a list of 121 cases, in young persons, with the ages at which they appeared. (*C. Taupin.*)

Age.	No. of Cases.	Age.	No. of Cases.
2	1	9	10
3	3	10	5
4	7	11	10
5	3	12	13
6	9	13	10
7	10	14	29
8	5	15	6

The anatomical lesions that characterize the disease were found as constantly as in the adult.

The examination of the blood drawn has not led to any decisive results. It was affirmed, indeed, (*Bouillaud*), that it does not resemble that of any other disease; but this is denied. (*Louis*.) It would seem, however, that it is generally less coagulable than in other morbid conditions. (*Andral, Gavaret, Raciborski.*)

Pathological characters.—Follicular enteritis, as the name imports, is seated in the follicles of the intestinal canal—commonly called the glands of Peyer and Brunner. In the stomach and duodenum, the latter are found in an isolated state; and at the termination of the jejunum and throughout the ileum, the former are seen agglomerated together to the number of thirty or forty, or more, and arranged in round or elliptical patches. They are met with likewise in the colon, associated two and two, and even in a larger number.

In their physiological state, the glands or follicles of Peyer are raised so little above the surface of the mucous lining of the intestine, and differ so little from it in appearance, that it requires care to distinguish them; but when diseased, as in typhoid fever, the patches become thickened, and their colour somewhat changed. This appearance differs, however, according to the period of the disease at which it is observed. When examined at about a week from the commencement, they are, at times, of a dull white,—but, at others, of a deep red colour; the hue, however, varies materially. Their size varies likewise, but they project to a greater or less extent from the mucous membrane, and have well defined margins. The patches are generally of an elliptical shape, especially the largest, which have been observed two or three inches in their largest diameter. By the side of these, small tumours of the size of hempseed, and similar to pustules, are often observed, which are the glands of Brunner tumefied. (*Louis, Andral.*)

The number of the patches varies; at times, there is but one; at others, twenty or more; and almost always many of the isolated follicles are affected.

The eruption usually commences at the termination of the ileum and the ileo-cæcal valve, whence it proceeds upwards.

Later on in the disease, ulcerations are perceptible in some of the patches. These are of different sizes, sometimes being very small; at others, occupying nearly the whole patch. These ulcers implicate the mucous coat, and may destroy the muscular coat. At times, they even perforate the peritoneal coat. Not unfrequently, there is a large and deep ulcer, situate almost, or quite, in the ileo-cæcal valve, whilst some elevated patches, higher up the intestine, are free from ulceration. (*Hale*, of Boston.)

These ulcerations admit, unquestionably, of cicatrization. This has been witnessed frequently, and may occur with or without the formation of a new mucous membrane. (*Andral*.) The affection may also terminate in perforation of the intestines and in gangrene.

The period, at which ulceration takes place, varies, according to the character of the disease. In two cases, ulcerations were found before the twentieth day; whilst in another, the disease had continued four months, and yet there were but eight ulcers, and no cicatrization. (*Hale*).

Of forty-six cases, recorded by a distinguished observer (*Louis*), ten terminated fatally from the 8th to the 15th day; seven from the 16th to the 20th; twenty from the 20th to the 30th, and nine after the 30th day. The pharynx was the seat of morbid change in eight cases; of ulceration, in six; of submucous purulent infiltration, or of false membrane deposited on its free surface, in two. In no instance were the follicles of the pharynx diseased in the manner of those of the intestine. The ulcerations were not found in any subject dying before the 15th day, and in one case only, which proved fatal, after the 30th. In seventy bodies of those who had died of other acute diseases, exclusive of variola, no single instance of pharyngeal ulceration occurred; hence, M. Louis regards the pharyngeal ulceration as entitled to the rank of a secondary lesion in typhoid fever.

Similar ulcerations existed in the œsophagus in seven cases, and they were generally attended with some more or less marked lesion of the mucous membrane of the stomach, which in no instance led to perforation, and was observed only in subjects that died after the 16th day. No such ulceration was observed in those who died of other acute diseases, although extensive destruction of the mucous coat, with softening, and attenuation of the submucous tissue—a lesion that terminated in perforation of the œsophagus in two cases under the care of another observer (*Barth*)—occurred in three instances. The appearances observed in the stomach were by no means distinctive.

The condition of the mesenteric glands—as might be presumed—is dependent upon that of the lining membrane of the intestines. These glands are the lymphatic ganglions to the intestines, and when any source of irritation exists in the latter, the ganglions

become enlarged like those of the groin and axilla, when adequate irritation exists in any part of the lower or upper extremity. The mesenteric glands which correspond with the morbid follicles, may be simply enlarged, red and infiltrated, as in the earlier stages of the disease; or they may be softened and in a state of suppuration, in the latter stages.

The spleen has generally been found in a morbid condition. Yet its lesions vary materially. At times, it is hypertrophied and softened; at others, small and denser than natural, and, at others again, it was apparently healthy. The changes in the condition of the spleen occur at an early period of the disease, but they are not distinctive, and are met with in diseases of very different natures. (*Andral*.) The same may be said of the liver, which in twenty-seven cases examined appeared to be healthy in structure in fourteen; more or less soft or friable in ten; hard in one; congested in one; and, in one, the serous coat of the left lobe was highly inflamed, and covered with a coating of lymph. (*Hale*, of Boston.)

The morbid appearances presented in the other organs of the body are by no means distinctive. The same softening of the heart has been met with in this form of fever as in typhus; and in both diseases, the feebleness of pulse has been ascribed to this condition. (*Louis*, *Stokes*, *Graves*.) The lining membrane of the heart and arteries has been found redder than usual; and that of the veins thickened, injected, and ulcerated. These lesions have not been regarded as special to the disease under consideration. They have been found in other affections, and some of them have been esteemed, in the majority of cases, cadaveric. (*Andral*.)

As in other fevers attended with much cerebral disturbance, the encephalon has been carefully examined, but without meeting with any appearances that could satisfactorily account for the phenomena; so that it has been laid down as a principle, that, in this disease, there is not a nervous symptom, which may not manifest itself without any appreciable alteration in the brain and its dependencies, and that when anatomical lesions of the nervous centres are met with, they are so slight and inconstant as not to permit any rational consequence to be deduced from them.

It would appear therefore, that the morbid condition of the glands of Peyer and Brunner is the most constant lesion in follicular enteritis or typhoid fever, when the two terms are used synonymously; and that it is the pathological state, which generally characterizes the malady. Hence, the different names that have been given to the disease, and the cause of its being considered an "intestinal exanthema" by some. Yet even by those who regard the typhoid fever in this light, it is admitted, that the morbid condition of the follicles may be absent, and that many cases have occurred, where all the symptoms of typhoid fever existed; and yet on dissection there was neither the "*exanthème intestinal*," nor any lesion of the digestive tube, which could account for death. (*Louis*, *Bouillaud*, *Andral*.)

Andral remarks, however, that the lesion of the follicles is met with in ninety-eight cases in the hundred; and some have affirmed, that it is found in all cases. (*Hale*, of Boston.)

It is proper to remark, that disease of the glands of Peyer is found on the dissection of persons who have died of phthisis accompanied with diarrhœa. The intestinal follicles also may be morbidly developed in certain diseases—as scarlatina, and cholera morbus. (*Andral*.)

An interesting question arises—to which it is only necessary to make a brief allusion—as to the pathological importance of this lesion of the follicles? There certainly would not appear to be sufficient reason for the importance that has been assigned to it by some, in the production of the phenomena of typhoid fever. It has been remarked, that all the symptoms of typhoid fever may present themselves without the intestinal lesion; and that the latter may exist without the presence of the former. There would seem, consequently, to be some impropriety in placing typhoid fever amongst the Diseases of the Digestive Tube. (*Andral*, *Piorry*.)

The function of these follicles is to secrete mucus to lubricate the mucous membrane. They resemble, indeed, the sebaceous follicles of the skin in their structure and functions, and it is not probable, that they can be so intimately associated in their morbid derangements with the great vital organs as to give occasion to the ataxic and adynamic form of fever, which has been ascribed to them. The affection of these follicles would appear to be a symptom like the eruption of measles or scarlatina, and to be produced by the same cause, that gives rise to the other symptoms of typhoid fever, but which cause—in the existing state of science—is inappreciable.

Treatment.—The management of typhoid fever reposes upon the same general principles as that of the other forms of fever already described, and especially of such as are complicated with inflammation of the lining membrane of the stomach and small intestines,—the bilious or gastric remittent, for example. It need scarcely be said, that where one of the most constant—indeed the most constant—of the pathological conditions is inflammation of the follicles of the intestines, or its results, with frequently more or less inflammation of the mucous membrane itself, violent remedies of the emetic or cathartic kind should be used with caution. It has been already observed, that these agents are of little or no value in cutting short continued fever, and if they do not arrest it, they are certainly well calculated to increase the intestinal affection. This—as has been seen—occurs early in the disease; and, therefore, if emetics and violent cathartics are admissible, it can only be at the very onset.

Still, although violent cathartics may be improper, the bowels—as in every other form of fever—should be kept open daily, by the mildest cathartics, as by castor oil in small doses, or by unirritating enemata.

A modern writer (*Bouillaud*) has recommended the plan of bleeding *coup-sur-coup*, which, according to his testimony, has proved very successful: but it would seem that he selected for experiment the cases only that were brought under his notice at the commencement of the affection, and that not a few of them were by no means cases of typhoid fever: if allowance be made for these, it would appear, that the mortality in his wards was really greater than elsewhere, and that the average duration of the disease in those who recovered under his care, was not less than that observed by other practitioners. (*Louis*.)

Antimonials—on the contra-stimulant plan—have been recommended on excellent authority, (*Professor Jackson*, of Boston;) but they have not met with the same favour in the hands of others; (*Hale*, of Boston;) and even when antimonials are administered in much smaller doses, as diaphoretics, in fever, they have been found to do harm, where any decided tendency to irritation of the bowels existed. (*Bright*.)

The indications to be fulfilled are precisely those that present themselves in the cases of fever already referred to; but even more caution perhaps is needed in the regulation of the diet both during the active period of the disease, and the long convalescence. When inflammation has attacked the follicles, it may be aggravated by errors of diet more than by any other circumstance; and if the inflammation has gone on to suppuration and ulceration, time must elapse for the recuperative efforts to be properly exerted, and, in the meanwhile, the blandest diet should be recommended.

The treatment of the typhoid fever of children must repose on the same principles. It will require, however, even less activity. The researches—few in number, it is true—of some recent observers, (*Rilliet* and *Barthez*,) are rather favourable to the use of the sulphate of quinia.

4. *Plague*.

SYNON. Pestis, P. orientalis, P. contagiosa, Pestilentia, P. orientalis, Febris seu Synochus pestilentialis, Læmos, Anthracia pestis, Typhus pestis, Exanthema pestis, Oriental or Levantine Pest or Plague, Pest, Typhus of the East; *Fr.* Peste, Typhus d'Orient; *Ger.* Pest, Pestkrankheit.

The nomenclature of this disease—which is almost exclusively of eastern climes—sufficiently exhibits the different views that have been entertained of its nature. By most writers, it is regarded as a fever of the typhous family; but some of the most recent writers have defined it to be “an exanthematous disease, the eruption consisting of buboes, carbuncles, and pustules, white, livid or black, and generally attended with malignant and very fatal fever.” (*Brown, Shapter*.) This definition does not remove it from the typhous family; for it has been shown already, that both typhus and the typhoid fever have been esteemed, by some, as exanthematous in their character.

Diagnosis.—It does not appear, that there are any very distinct

prodromic symptoms. Usually, the attack is ushered in by a strong feeling of languor and lassitude, with uneasiness in the encephalon. The countenance indicates anxiety and heaviness. There is, indeed, a feeling of great anxiety about the præcordia; and extreme restlessness, both from this cause and from pain, which is referred to the heart itself. The gait becomes vacillating; and the debility rapidly increases, until the upright posture cannot be maintained. The stomach often becomes affected with nausea and vomiting; and the patient suffers from a feeling of faintness, but rarely faints in reality. The countenance becomes more and more haggard, and the fixed anxiety of expression is only interfered with by twitchings and convulsive movements of the features. The skin is commonly hot, dry, and harsh to the feel. The pain in the præcordial and cardiac region becomes more intense; and vomiting, usually of a bilious matter, takes place. The tongue is swollen, which is esteemed a very marked symptom of plague, and is covered with a white fur, glistening towards the centre, like mother of pearl: towards the tip and edges it is moist and clean. The pulse is accelerated, small, and contracted, beating from 115 to 130 in the minute, (*Bulard*;) the respiration is laborious; the speech thick, indistinct and tremulous. Shooting pains are experienced in various parts of the body, especially in the axillæ and groins; and, on examining those parts, swellings are perceptible, which, if they are seated in the conglobate glands, constitute bubo; if in the surrounding tissues, carbuncle. These, along with the other symptoms, are characteristic of the disease. In the more favourable cases, these swellings are of a bright red colour; in the more unfavourable, of a livid or purple hue. The bowels are usually confined, and not readily acted on by medicine; and the urine is high coloured, scanty, and sometimes wholly suppressed.

This first stage usually continues for about twelve hours, when it is succeeded by the second stage, or that of reaction. The encephalic symptoms now become more marked; there is great restlessness, stupor, delirium, or coma; the tongue becomes tremulous; the countenance has a peculiarly confused expression; the muddy look of the eye, which existed during the first stage, continues, but it is strangely mingled with an unusual lustre, and the pupil is very much dilated. The pulse varies in its character, being, at times, hard and full; at others, feeble, fluttering and intermittent. The tongue is much swollen, dry, parched, and of a yellowish colour, with a red streak down the centre, and at its edges; sometimes it is brown, cleft, and like horn, but it never acquires the thick fur, and the black colour so often seen in the other malignant fevers. The teeth, lips, and lining membrane of the nose are coated, however, with dark sordes, resembling soot, which, as they dry, fall off in the form of powder. Gastrodynia is present in a great degree, and it is aggravated by the occasional vomiting of a blackish coloured fluid; and, at times, there is incessant nausea, which nothing seems calculated to relieve. At this period of the disease,

a hemorrhagic tendency is often apparent, and blood is exhaled from the different mucous surfaces.

The uterus is said to be particularly excitable during the plague, so that menorrhagia often supervenes; and, in case of pregnancy, abortion is almost certain to occur.

The restoration of a free cutaneous transpiration is a very favourable occurrence, and, if followed by a remission of the symptoms, it almost always indicates that a happy termination is about to take place. This usually occurs at an early period of the second stage, and is characterized by a general abatement of the excitement,—the pulse falling to about the natural standard, and being steady in its character; the expression of the countenance becoming more natural; the eye clearer, the conjunctiva losing its injected appearance, the pupils being no longer dilated; the buboes enlarging, becoming more active and suppurating, or the carbuncles suddenly appearing with broad surfaces, sometimes to the extent of four or five inches. On the other hand, if the disease is about to terminate unfavourably, the general skin remains dry and harsh, whilst that of the face and hands is covered, perhaps, with a cold sweat; the pulse becomes small, fluttering, and almost imperceptible; there is constant, low, muttering delirium; the breathing is hurried and laborious; the eye sunken so that the countenance has a ghastly expression, and the skin is covered with petechiæ and vibices, whilst the buboes and carbuncles are not fairly developed. The powers of life are now evidently giving way, and death may ensue without a struggle, (*Shapter*;) although it is affirmed, that death very rarely follows a gradual extinction of the powers of life, and that, in the greater number of cases, it is ushered in unexpectedly by some violent delirious effort, or suddenly terminated by convulsions. (*Sir A. B. Faulkner*.)

Different varieties of the disease have been made, according to the intensity of the symptoms, (*Desgenettes*;) but they do not appear to be necessary, as the disease is in all cases the same. A recent writer, (*Shapter*;) upon similar principles, has established three divisions.—1. Simple or glandular plague. 2. Eruptive plague, attended by a period of reaction; and 3, Malignant plague, in which the period of reaction is either entirely absent, or but very imperfectly developed.

When blood is drawn from a plague patient, it flows readily, and in a continued stream. It is described as having a peculiar odour, and being of a dark red colour, which is incapable of changing into a bright red; on the contrary, after standing for a while, the mass assumes a violet red tint, becomes cupped, and has a red coloured serum floating in its concavity. At times, however, it shows no tendency to the formation of a coagulum, but remains quite fluid, of a livid colour, and strong odour, which seems to proceed from drops of an oily looking fluid floating on its surface. After death, the blood is found in the arteries in small quantities, and is as black as that of the veins, fluid, and seemingly decomposed. In the

large venous canals, there is often found floating in it the oily looking substance, which is discharged with it during life. (*Shapter.*)

The duration of the plague is commonly from two to eight days. Many cases, however, have occurred in which death has taken place in a few hours, as in other malignant fevers. In such case, death may occur before the appearance of buboes or carbuncles.

Causes.—The causes of the origin and spread of the plague have furnished a wide field for discussion. The view of some is, that it originates in the Delta of the Nile, whence it migrates to commit its ravages along Syria, Asia Minor, and especially at Constantino-ple; but the evidences of this migration are insufficient, and there is reason to believe, that under endemico-epidemic influences, of whose nature we know no more than we do of those that give occasion to other forms of fever, it is engendered in these and other places. At one time, its ravages were not limited to these regions. During the prevalence of the Black Death, as it was termed, of the fourteenth century, it is computed that Europe lost twenty-five millions of inhabitants. (*Hecker.*) We have frightful accounts, also, of its ravages at Marseilles, Moscow, London, and other places, from which it is now wholly banished. The last and the great plague of London was in the year 1665. It was followed by the great fire in 1666; which probably had some agency in preventing the recurrence of the disease. Certain it is, that no visitation has taken place since; and it is more philosophical to suppose, that the result was owing to better ventilation, and to an improvement of the locality, by an appropriate system of draining and other medico-municipal regulations than to the enforcement of any quarantine laws. As has been elsewhere remarked, these prevalent maladies require a union of terrestrial and atmospheric influences for their production,—a combination, similar to that which prevails in certain complex locks; requiring that two of many numbers shall be brought together, in order that the lock shall open; whilst in all other conjunctions it remains secure. In the case of the great fire of London we may presume, that the endemic influences were modified by the altered locality; and hence although favourable atmospheric conditions may have since been present, still as there was no concurrence, there was no endemico-epidemic disease.

It has been presumed by many, that it may be, and often is, generated by filth, (*Desgenettes, Larrey,*) but this admits of great question. At all events, other circumstances must be superadded. Cairo, and the cities of Syria, Asia Minor and Turkey, are distinguished for their want of cleanliness—not only as regards the cities themselves, but the inhabitants; yet, many of the Italian cities and villages are no less celebrated; and Lisbon has been immortalized for its noisome condition:—

“For hut and palace show like filthily
The dingy denizens are rear'd in dirt;
No personage of high or mean degree

Doth care for cleanness of surtout or shirt;
Though shent with Egypt's plague, unkempt, unwash'd, unhurt."

In none of these places is plague endemico-epidemic.

As in other forms of malignant fever, the question has arisen here:—Whether plague be communicable? (*Bulard.*) To test this, persons have been inoculated; but they have been at the time in the very localities in which the disease prevailed; and, consequently, no positive deductions could be legitimately drawn. To test the question fairly—as has been properly remarked, (*Shapter,*) it would be necessary to institute a most unjustifiable series of experiments by inoculating with plague products persons living at a distance from the infected localities, and who could have no communication, direct or indirect, with plague cases, excepting through the matter with which the experiment was made.

The whole evidence in favour of contagion is by no means overwhelming, and has, indeed, been esteemed by many imperfect and unsatisfactory. So many contradictory statements of *facts* have been brought forward, that it is difficult to form any exact opinion either as to the origin or mode of extension of the disease.

It is certainly, we think, an endemico-epidemic, and this inference is confirmed by the influence of season, which, in plague countries is a common topic of observation. We are told, indeed, that the decrease of plague in the East towards the middle of June, is so remarkable, that at Cairo, St. John's day, which is the 24th of June, is ever understood amongst the superstitious inhabitants to put a period to the disease. The uniformity of its decrease, as the summer advances, is so very marked, that persons, who have previously confined themselves, come forth invariably on this day, mix with other people, transact their ordinary affairs, and restrain themselves in no respect from any apprehension, that they will take the disease.

But although the disease is evidently dependent upon locality and season; it has been supposed, that a principle may be given off from a plague patient which, if concentrated,—as in very malignant forms of the disease, and in pent-up situations, where proper ventilation is impracticable,—might cause the disease in a healthy individual. Such may be the case, but by many, who have had ample opportunities for observing the plague, it has been denied. It has been farther denied, that the disease can be conveyed from a patient, by one unaffected, to another; and although the quarantine system is founded on a belief, that the disease can be imported by persons and goods; it has not only been questioned, but unequivocally denied, that fomites, in themselves, have any power of transmitting the disease. (*Shapter.*)

Were this established, the restrictive regulations of a supposed sanitary kind, which have been esteemed so essential in preserving countries from the plague, ought to be abandoned; and it has been already shown, that in the case of the yellow fever, they are vexatious and wholly inoperative. The fears of communities are, how-

ever, so much on the alert in regard to both these alarming diseases, that it is difficult to induce municipal authorities to submit to experiments, which could be attended with but little real danger, in order to have the question fairly settled; and whilst doubts exist, commerce must consent to be fettered.

Pathological characters.—It has only been of late years, that extensive opportunities have existed for discovering the morbid appearances in cases of plague. As the disease generally occurs in Mahomedan countries, and as a strong objection exists in them to post mortem examinations, difficulties were thrown in the way of the pathologist; and, besides, the ideas in regard to the contagious nature of plague, have prevented physicians from availing themselves, as extensively as they might, of the numerous cases that presented themselves to their notice. In recent periods, the abhorrence entertained for dissections has diminished; and the notions of the contagious nature of the affection have not been credited by several physicians; hence, necroscopic examinations have been by no means unfrequent, so that we have now numerous records of personal observation made, not only by European physicians, but by a Mahomedan and native of Egypt. (*Clot Bey.*)

The remark, that the anatomical changes, found in plague subjects, are the same as in typhus, (*Andral*), although it has been combated, (*Dubois d'Amiens*), appears to be essentially correct. There are no lesions, which, in the existing state of our knowledge, can be considered characteristic of plague.

The corpses of such as have died of this disease have been described by many as especially hideous; but this has been denied by those who have had large opportunities for observation. (*Clot Bey.*) The petechiæ are described as being found particularly on the neck, sides of the chest and limbs: buboes are, of course, to be expected in the axillæ and armpits, not often in the neck; and, in those who have had no buboes, all the lymphatic glands have been found enlarged. The writer, just cited, affirms, that the lymphatic glands are always engorged, sometimes to five or six times the natural size; softened, and of a colour like lees of wine, and sometimes black,—those of the groins and armpits forming, by their agglomeration, a homogeneous mass, of a colour almost always like lees of wine, with effusion of black blood into the surrounding cellular tissue.

On cutting into the enlarged lymphatic ganglions, the integument covering them has presented the appearance of being bruised; considerable effusion of blood has been found in their immediate neighbourhood; and surrounding and connected with them knotted masses of lymphatic tissue are seen, with portions of cellular membrane, the inflammation and enlargement of which form small tumours. The lymphatic system has, indeed, been esteemed as the primary seat of the disease; all the other morbid actions being considered secondary. (*Bulard.*)

The pericardium has been found to contain a larger quantity of

fluid than usual, and this of a bloody character. (*Larrey.*) The heart itself is generally flabby and enlarged; in some cases, it has been even twice the natural size, and its fibre pale and softened. Both the right side of the heart and the pulmonary artery, and, indeed, the vena porta, and the whole of the venous system, are generally distended with black blood. The liver and spleen participate in the engorgement, and the latter viscus has been of double the usual size, and markedly softened. The kidneys are usually of increased size, and sometimes thrice as large as in health. Their substance is softer than natural, and tears with facility. It is described as of a deep violet hue, gorged with blood, which has transuded into the pelvis. (*Clot Bey.*)

In the alimentary canal, there is, almost always, general softening of the membranes, so that the parietes tear with the greatest ease. The stomach contains a blackish fluid, which has been subjected to analysis, but, as might be expected, without any important result. The lining membrane of the stomach has been commonly much injected, exhibiting red patches like petechiæ, which, sometimes, from their size, might be considered ecchymoses. (*Clot Bey.*) The lining membrane of the small intestines was in a similar condition, but not to the like extent.

The encephalon has not shown any marked pathological alteration. The sub-arachnoid veins and the sinuses were engorged; but the substance of the brain itself, as well as of the cerebellum and spinal marrow, has been generally natural. In some cases, however, it was softened. (*Clot Bey.*)

It would appear, from the above statement of the results of necroscopic examinations, that although we might presume, that, in this terrific disease, serious organic mischief must exist, pathological anatomy has not taught us anything precise; and it is probable, that the lesions which are really met with, do not constitute the disease, but are secondary in their character, and the result, as has been remarked, of the miasmatic poison. (*Rostan.*)

Treatment.—It is impossible to lay down any precise rules regarding the treatment of a disease where so much difference of sentiment has existed. We are safe, however, in stating, that the general principles, which guide us in the administration of remedies in typhus, are equally applicable here. To these the reader is referred. It is to be deplored, that all remedial agencies are too often ineffectual, owing to the malignity of the disease; and, accordingly, we are not so much surprised at the information, that a recent observer, after five months' experimenting with all kinds of treatment, and all modifications of it, in about 1000 cases, at length arrived at the melancholy conclusion, that although the medicines produced their effect upon the organism, yet the malady neither ceased nor changed. (*Shapter.*)

The local treatment is generally very simple, and consists in applying a warm emollient poultice to the buboes, and mild ointments to the carbuncles; and if there be deficient action, the un-

guentum resinæ flavæ, or the unguentum creasoti. It was at one time proposed to extirpate the buboes either by cauterization or incision; but this strange remedy—as might have been expected, instead of relieving the patient, added materially to his sufferings, and aggravated the symptoms of the disease.

It has been affirmed, that in the countries in which the plague prevails, the water-carriers and the oil-carriers are generally exempt from the disease, whence it has been inferred, that it might be serviceable to anoint the body with oil, and to use frequent ablutions and the bath. Frictions with warm oil were used for many years by the superintendent of the Pesthouse at Smyrna, (*Luigi*), who states them to be more efficacious, both as preventives and as means of cure, than any other course; but subsequent experience has shown them to be not only inefficacious, but injurious from the fatigue they occasion. (*Larrey*.)

Whatever may be the effect of inunction with oil as a preventive, there can be no doubt of the efficacy of the other hygienic means—ablution and bathing. Whether the disease be, or be not, contagious, it is all-important that a proper attention be paid to cleanliness and free ventilation; and these, along with sobriety, and regularity in all things, with a proper allowance of good and wholesome aliment, constitute the best prophylactics.

Experiments have been instituted with the view of determining, whether the chlorides be good disinfectants in this disease, (*Pariset, Darcet, &c.*), but they have been too few to settle the question. It has been affirmed, (*Henry*), that exposure to a heat equal to that of boiling water will destroy all contagious miasmata, but the difficulty, in these cases, lies in determining, whether such miasmata really exist where they are suspected to be present. (*Chervin*.) Still, it is well to bear in mind these observations, and to adopt every precaution, where any doubt exists regarding so formidable a malady.

It has been an old observation, that persons, who have issues discharging freely, do not fall victims to the plague, (*Bulard*), and it has been affirmed, on excellent authority, (*Larrey*), that the plague rarely attacked wounded men, whose wounds were in a state of plentiful suppuration, but that as soon as the wounds were skinned over, they were equally liable to the disease. Hence, it has been suggested, that issues might be used in the way of prophylaxis, and a recent writer (*Shapter*) encourages the idea. On this point, however, as on the whole subject of plague, the author is unable to say anything from his personal observation.

SECTION IV.

ERUPTIVE FEVERS.

SYNON. Exanthematica, Exanthemata (of some.)

Under the head of eruptive fevers may be comprised those cutaneous eruptions that are essentially associated with fever, (*Good*;)—the diseases of the skin, that are accompanied by a lesion of circulation. (*Andral*.) By many writers (*Geo. Gregory*, *Professor Eberle*, of Cincinnati) the various eruptive fevers have been classed under two heads:—the *major exanthemata* and the *minor exanthemata*; but they differ so essentially from each other, according to the definitions usually given, that this arbitrary division has been very properly rejected by most pathological writers. Thus, the major or genuine exanthemata are said to have the following characters. *First*, They are marked by the presence of fever, which runs a defined course. *Secondly*, They are attended with an eruption, which, like the accompanying fever, goes through a regular series of changes. *Thirdly*, They occur to every individual once, and once only during life; and *Fourthly*, They arise from specific contagion. Under this head, are classed—smallpox, chickenpox, cow-pox, and modified smallpox, measles, and scarlet fever.

The minor exanthemata are vaguely affirmed to comprise “a few other diseases of lesser importance,” which are allied, in some respects, to the others—as herpes, urticaria, lichen, roseola, pompholyx and frambœsia. (*Geo. Gregory*.)

It will be at once seen, that as regards individual diseases thrown together as major exanthemata, great doubt must exist as to their possessing the characters that have been assigned to them; and the best pathological division would seem to be,—to separate those cutaneous affections of which fever forms an essential accompaniment, from those in which the disease appears to be of a chronic character, and to be essentially local, and seated in the skin;—the morbid action either being dependent upon a vicious condition of the blood, or upon nutritive or secretory irritation or aberration in the intimate tissue of the derma.

It has been a question amongst pathologists as to the pathological relation between the fever and the eruption. In most cases, it will be found, that the former precedes the latter, but it by no means follows, that they always stand towards each other in the relation of antecedent and relative. The ancients had no more difficulty with these than with other fevers. In the more simple forms of fever, they believed, that a morbid or peccant humour—a cause of ferment—existed in the system, which had a period of crudity and of concoction; and that, when properly matured, it was thrown out of the economy by some favourable crisis; hence their doctrine

of critical discharges. In the case of the eruptive fevers, they appeared to have still stronger support for their doctrine,—the morbid matter being thrown out on the cutaneous surface. They lost sight, however, of the important fact, that in the case of certain eruptive fevers, the fever, instead of being relieved by the appearance of the eruption, appears to increase, and that in many there is no throwing out of humour—the eruption being a mere efflorescence on the skin.

Other pathologists regard the exanthematica to be true phlegmasiæ of the skin,—and others, again, peculiar and essential affections of the derma—not of the epidermis, as strangely affirmed by one writer of eminence, (*Mackintosh*;) that the resulting phenomena are secondary, and dependent upon the sympathy existing between every part of the dermoid structure,—skin and mucous membranes; whilst others, again, are of opinion, that the eruption ought to be esteemed a mere symptom—functional expression—of this class of diseases, and that the primary affection is seated in the mucous membranes, the nature of which is inflammation, more or less acute and extensive; and that the part generally most implicated is the mucous membrane of the lungs, especially in measles and smallpox; whilst that of the bowels is the part chiefly, if not wholly affected in urticaria, roseola, and miliary fever. (*Mackintosh*.)

Lastly, others, again, but they are now few, consider most of these fevers to be modifications or combinations of gastroenteritis. Thus, gastroenteritis is asserted to be the necessary precursor of smallpox; ophthalmia, coryza and bronchitis to be precursors of the rubeolous eruption; gastroenteritis, alone or accompanied with angina tonsillaris, the precursor of scarlatina—the visceral phlegmasiæ constituting the whole danger of these diseases. (*Broussais*.) “But smallpox”—adds the writer just cited—“is distinguished from the two others by the intensity of the cutaneous inflammation menacing the external parts with frightful disorganizations, such as ophthalmia and abscesses; and tending to renew the visceral phlegmasiæ at a period when the forces, being already much diminished, have a difficulty in effecting a gradual resolution, and the repulsion of the irritation towards the excretory organs. Here are, hence, two indications proper to this disease,—that of moderating the inflammation in the tissue of the skin; and that of recalling it towards the exterior by revellents, when it appears to have a tendency to a premature repercussion. The other indications, the principal of which is, to facilitate the eruption by moderating the excess of visceral inflammation at the commencement, are common to all the eruptive phlegmasiæ.”

According to these views, the eruption is regarded as a natural effort to direct the irritation towards the cutaneous surface; and hence, it has been affirmed, that it ought to be looked upon as a “natural blister, acting as a contra-irritant.” “It is produced by powers inherent in the constitution, that enable it to remove so

much of the diseased action from an internal organ, the functions of which are more immediately necessary to life." (*Mackintosh*.)

That the whole of the dermoid tissue is in an unusually impressible and impressed state can scarcely admit of a doubt; but the cause of the difference of the eruption in these different cutaneous phlegmasiæ, if they may be so regarded—and of the implication of various portions of the mucous membrane, in the different affections, is not more easily explained than the appearance of buboes and carbuncles in typhus; of the *taches rouges* in typhoid fever, or the petechiæ in typhus.

The tardiness in the appearance and progress of the eruption—especially the non-filling of the pustules, or their premature subsidence in smallpox—is generally regarded as an unfavourable symptom; and they who believe, that the eruption is a natural counter-irritant, would ascribe the mischief to the vital powers not being able to duly establish the necessary amount of cutaneous counter-irritation. Yet, this condition of the pustules very generally accompanies cases of confluent smallpox; in which the extent of counter-irritation would appear to be greatest. In the most favourable cases, there is the least amount of internal inflammation, and, at the same time, of cutaneous irritation.

There is something strange and unaccountable in the whole history of the more prominent of the eruptive fevers;—take, for example, smallpox; its capability of being propagated, with almost unerring certainty, by inoculation;—the subsequent appearance of the eruptive fever, which can be foretold with accuracy, as well as that of the eruption; the regular progress of the pustules to maturation; the fever of maturation; the disappearance of the disease at fixed periods, and its strictly self-limited nature, are all points, which are known to appertain to it, and many of them to other exanthemata; yet the cause of all these phenomena, thus exhibiting themselves, and regulated according to definite laws, is, in the present state of science, beyond our knowledge. Instead, therefore, of speculating upon them, we pass to the results of observation in regard to the laws that regulate their propagation, and the morbid phenomena presented by them individually; on which points we possess numerous and interesting facts.

In their character as to mildness or malignity, almost all these diseases are materially modified by the nature of the prevailing epidemic; they are unquestionably, too, modified by particular constitutions; and the difficulty in their management is greatly dependent upon the difficulty in appreciating those points. "The treatment of these diseases," observes a recent writer (*Marshall Hall*), "does not depend merely upon the question, whether it be rubeola, or scarlatina, or other eruptive fever; but upon the question, whether the disease, be it what it may, be complicated with internal organic changes, or modified by constitutional circumstances. These are the really important points for diagnosis, the important questions on which recovery or death depends; and I do not hesitate to say, that, in these respects, but especially in that of the com-

plications, the subject is involved in the most intense obscurity, and offers ample scope for investigation. If there be anything *peculiar* in these complications, that *peculiarity* is completely unknown, and must be established by new examinations. If such peculiarities of morbid change require peculiarities in the treatment, this too remains to be ascertained by future inquiries. It has not even been ascertained, whether the affection of the mucous membranes be merely inflammatory, or whether it be specific; that is, whether it be rubeolous in rubeola, and scarlatinous in scarlatina, as it is variolous in variola. But I believe it is so. The observation applies not to the eyes, fauces, larynx, trachea and bronchia only, but also to the stomach and intestines."

Many of the eruptive fevers are apt to leave behind them morbid conditions, which require particular attention. These consequences or sequelæ are indeed, at times, of serious import. They will be indicated under the particular diseases.

In the consideration of the various eruptive fevers, the arrangement will be followed, which was adopted in investigating the chronic cutaneous diseases; taking the elementary form of the eruption as the basis of the classification.

I. EXANTHEMATOUS ERUPTIVE FEVERS.

1. MEASLES.

SYNON. Rubeola, Enanthesis rubeola, Morbilli, Febris morbillosa, Typhus morbillosus, Phœnicismus; *Fr.* Rougeole, Fièvre morbilleuse; *Ger.* Masern, Masernkrankheit, Kleine Pest.

Confusion has arisen amongst nosographers in regard to the names assigned to measles. In this country, and in Great Britain, at the present day, both rubeola and morbilli mean measles; but in Germany, *Morbilli* is the technical term applied to measles, whilst *Rubeolæ* means what they term *Rötheln*, on which it will be necessary to make some remarks hereafter.

It is only in comparatively modern periods that any clear distinction has been pointed out between the three great eruptive diseases,—smallpox, measles, and scarlatina. Of old, smallpox and measles were universally regarded as the same disease; and, within recent periods, the lines of demarcation between measles and scarlatina were far from being distinctly drawn. At the present day, no difficulty is experienced on this head.

Diagnosis.—Measles has been divided by some pathologists into four varieties,—*Rubeola vulgaris*, *R. sine catarrho*, *R. nigra*, and *R. putrida*, (*Willan, Mackintosh*;) others have described the more ordinary form of measles under rubeola vulgaris; the one in which the morbid action is limited to the skin, under rubeola sine catarrho; and that in which the intensity of the poison is manifested by the most malignant symptoms, under rubeola maligna; (*Geo. Burrows*;) whilst many of the German writers, in their unnecessary and bootless anxiety to embrace every variety that may offer, have made more numerous divisions still.—1. *Morbilli simplices*,

mitiores, catarrhales, Febris morbillosa simplex—the simple, favourable, or catarrhal measles. 2. *Morbilli inflammatorii, hyperstenici, morbilli cum febre inflammatoriâ*, inflammatory measles. 3. *Morbilli nervosi cum febre neuropathicâ*, measles with erethitic nervous fever. 4. *Morbilli putridi cum syncho putrido, morbilli maligni*, (Morton,) the putrid measles. 5. *Morbilli gastrici, morbilli cum febre gastricâ*, gastric measles; and *Morbilli spurii*, the false measles. (C. A. Tott, Most.)

These divisions are enumerated, not that they may be embraced, but avoided. No advantage, indeed, can result from them; for, in all the cases of the genuine disease, it is measles modified by particular circumstances, as by the nature of the epidemic, the constitution of the patient, and the internal organs more prominently implicated.

Usually, an attack of measles is preceded by premonitory or prodromic symptoms, chiefly characterized by an engorged or inflamed state of certain of the mucous membranes, as of the eyes, nasal fossæ, and bronchia. There are the usual phenomena of catarrh, with profuse watery discharges from the nose and eyes, and distressing cough. The symptoms of catarrhal fever continue from two to three days, when they become increased in violence; the fever becomes intense; nausea and vomiting often supervene, and the epigastrium is painful on pressure. The eyes become more sensible to light, and more inflamed; the cough is dry, and frequent, and is accompanied with hoarseness, dyspnœa, and a feeling of tightness across the chest.

About the third or fourth day from the invasion of these symptoms, the efflorescence makes its appearance under the form of small red spots, distinct from each other, circular, slightly raised above the surface, and of the shape and size of flea-bites. It first of all appears on the head, around the margin of the hairy scalp, behind the ears, and about the temples; then on the forehead, nose, cheeks and neck, whence it spreads in the course of the same, or of the next day, to the chest and limbs. The patches, formed by the confluence of the red spots, are at first small, but they gradually enlarge, and assume a semilunar or crescentic shape. At the end of about thirty-six hours, the eruption arrives at its height; and, commonly, in about five days from its first appearance, the tumefaction of the cutaneous surface disappears, and the eruption fades away in the same order as it advanced: the oppression and cough, and the other signs of disturbance in the economy yield, and finally disappear; and the cuticle soon separates in the form of scurf, or of small branny scales: a troublesome itching supervenes in the parts of the cutaneous surface that had been implicated, and the catarrhal symptoms fade away, leaving the patient suffering only under the debility induced by the previous attack.

This is the usual course of the mild form of the disease, but the symptoms are liable to anomalies:—for example, the eruption occasionally appears upon the body first, and afterwards upon the

face; and after declining it is sometimes reproduced; but these and other anomalies will be readily appreciated by the observant practitioner.

During attacks of epidemic measles, it is not unfrequently the fact, that the eruption goes through its stages without the ordinary catarrhal symptoms, and with little or no fever. It does not appear that this certainly protects the person from a subsequent attack of measles, and hence it is questionable whether it ought to be esteemed genuine measles, and whether it is not rather an abortive effort of the epidemic cause of the disease.

A malignant or putrid variety of the disease, which has been called *Rubeola maligna*, may certainly exist both sporadically and epidemically. Of the latter form, we have the history of numerous examples. (*Huxham, Sir William Watson.*) The disease appears to be of a congestive character, and to require a treatment similar to that which has been laid down under *Congestive Fever*. The fever generally assumes a low character, and signs of hyperæmia or inflammation may be detected, by careful examination, in some important internal organ. In some of these cases, reaction does not take place; or, if it does, the pulse remains feeble and oppressed, perhaps quick; and the surface is free from the redness and heat which so strikingly characterize ordinary measles. (*Armstrong, Mackintosh.*) In other cases, the symptoms are violent from the first, and the eruption comes out irregularly, receding perhaps and reappearing in irregular patches over the body, at one time red, and at another pale or livid, and interspersed with petechiæ or vibices; the mucous membrane of the tongue and fauces assuming a dusky red or livid colour, and great gastric distress, diarrhœa and meteorism being concomitants. The brain or the minute bronchial tubes are now attacked with inflammatory hyperæmia, and the patient often sinks rapidly, under all the signs of typhus, accompanied or not by those of typhoid pneumonia.

Lastly, during the existence of an epidemic, measles would seem to occur occasionally without the eruption. This appears to be paradoxical, and it would not be easy to establish, perhaps, that the affection was really measles. In an epidemic, which occurred in Germany, at the end of 1800, and the beginning of 1801, several children were supposed to go through the disease without the appearance of the eruption, (*Consbruck,*) and the same circumstance has been observed in epidemic scarlatina.

The sequelæ of measles are, in many cases, as dangerous as the disease itself, and hence great care is needed in the after treatment. In scrophulous children, the lymphatic ganglions are apt to become affected;—hence, troublesome inflammations of the glands of the neck, and tabes mesenterica; the eyes may be affected with ophthalmia, difficult of cure, and the foundation may be laid for the formation of tubercles in the lungs; or if they have been already there, and in a state of quiescence, they may—if the age and other circumstances of the patient are favourable—be excited to softening.

Occasionally, after measles, a true purulent secretion takes place from the lining membrane of the bronchial tubes. A case of this kind, which fell under the author's care in the Baltimore Infirmary, excited great interest from the quantity of pus that was expectorated, with the absence of every physical sign of a cavity in the chest. On dissection, it was clear that the whole of the secretion had been furnished by the bronchial mucous membrane.

At times, too, especially in the summer season, about the time of the recession of the eruption, dysentery, of the most fatal kind, supervenes, which may run its course most rapidly. In an epidemic measles, which prevailed in Virginia, twelve or fourteen years ago, several cases of this kind occurred, which were of the most intractable character.

Epidemic measles is very apt to be succeeded, especially in children's asylums, by stomatitis, which not unfrequently assumes the gangrenous form, and is very disastrous in its results. It has often prevailed to an afflicting extent in the children's asylum of the Philadelphia Hospital. An analogous kind of ulceration has likewise been seen in the external sexual organs of the female.

These are amongst the most prominent and troublesome sequelæ.

The general prognosis of measles is favourable. During the eruptive fever, and until the period of subsidence of the eruption, but little uneasiness need generally be entertained in regard to the cough, dyspnoea and other pneumonitic symptoms. Still, if they be more severe than usual, an observance of the physical signs should be associated with that of the functional phenomena; and still more is this necessary, if the symptoms do not diminish with the diminution of the eruption. Danger may, in such case especially, result from the pneumonia.

The signs of unfavourable import are those that denote serious implication of the encephalon, or the supervention of the typhoid or typhous symptoms before mentioned.

It is a common remark, that the disease is more fatal to adults than to children, (*Andral, Geo. Burrows*;) but this view is not assented to by all. (*Montgomery*.) The author's observation does not enable him to pronounce positively on this matter, nor is it easy for any one to do so, inasmuch as the cases occurring in adults are comparatively rare, and the difficulty great, therefore, in establishing a ratio.

Measles cannot easily, except at the commencement, be confounded with any other epidemic exanthema, except scarlatina. At the very first appearance of the eruption, it may be impracticable to distinguish it from variola; but the doubt soon disappears by the gradual increase in the prominence of the eruption, if it be the latter. The accompanying catarrhal symptoms form, also, a part of measles, whilst they are accidental in smallpox. These likewise form a means of diagnosis between scarlet fever and measles;—in the former, the accompanying symptoms being those of amygdalitis rather than of catarrh. The eruption, too, of scarlet

fever is a diffused lobster redness, the spots being extremely large, and they do not—as in measles—leave between them numerous small irregular spaces in which the skin preserves its natural colour. There is a difference, also, in the desquamation of the cuticle, in measles and scarlet fever; in the former, it takes place in branny scales; in the latter, in large pieces. The circumstance, too, of the existence of an epidemic, and of the probability of exposure to its influence, will aid in the diagnosis.

Causes.—The origin of this disease is no more known than is its cause. Like smallpox, it appears to have been of eastern origin, and in the works of the Arabian writers, it is not described as a new or unusual disease. (*Williams.*)

By many, it is supposed to have spread from its first seat by communication from one person to another, and in this way only. It would be singular, however, if no combination of influences could occur, capable of generating it sporadically,—if, in other words, the same combination could not take place at this day, which, of old, engendered the disease originally. This difficulty, with the impracticability of tracing the disease to any particular source, has led to the belief, that a “morbillous poison is always in existence, and ready to infect the predisposed.” (*Geo. Burrows.*) It would certainly appear, that the disease can, and does, originate *de novo*, without our being able to presume that it has been imported into the locality where it prevails; yet it is affirmed, that it was not known in the new world until it was imported in 1518, (*Andral,*) and as far as the author’s recollection goes, it is stated to have been unknown in New Holland.

The common—almost universal—belief is, that, when once induced in an individual, a poison is generated, which can cause the disease in one who has never been affected, either by contact or by diffusion through the atmosphere. To establish the fact of the first mode of propagation, inoculations have been practised with blood drawn from the arm of a patient, or with serum taken from the vesicles, that are sometimes associated with the characteristic eruption; and these inoculations are said to have entirely succeeded. (*F. Home, Monro, Cullen, Speranza, Willan.*) Yet the communicability of measles from one person to another is not assented to by all, as has been affirmed. (*Geo. Burrows.*) It is denied by a practitioner of great experience, (*Professor Dewees, of Philadelphia,*) yet on evidently insufficient grounds. In the cities, it is a difficult task to decide, whether any disease extends by contagion, especially when it prevails epidemically; but, in country places, opportunities often exist, which establish the fact incontestably. Thus, when the author was Professor of Medicine in the University of Virginia, one of the students left his boarding house to visit his friends, who resided about forty miles distant. When he arrived there, he found that measles prevailed extensively, and he himself was exposed to the contagion. He returned to his boarding house, and, in a few days, the eruption of measles

appeared, and went through its stages in the regular course. One or two persons in the house were likewise attacked, but by great care, it extended no farther; and no other case appeared within many miles of the university. This case established unequivocally the fact of communication, and many such must have occurred to those who are extensively engaged in country practice.

It has been elsewhere remarked, that in order that endemic fevers shall prevail extensively, there must be a favouring condition of the atmosphere; and, therefore, that they ought rather to be termed endemico-epidemics. A similar remark applies, also, to the communicable exanthemata. Were the conditions always favourable for their spreading, they would be constantly rife, and to the same degree, in a community; whereas, it is well known, that the bills of mortality often indicate no fatal cases for months; and, at times, even for years in our larger cities; whilst, at other times, the number of deaths is appalling. To spread extensively, therefore, these diseases require a union of atmospheric and contagious influences, or they are epidemico-contagious in their nature.

After the contagious miasm has impressed the system, it remains for a time without affording any indications of its presence. The time that elapses between its reception and the commencement of the eruptive fever is termed in this, as in the other contagious diseases, the *latent period* or the *period of incubation*. This period is by no means as fixed as in smallpox, and would appear from the results of different observers (*Heberden, F. Home, Willan*), to vary from six to sixteen days.

The author, some years ago, saw a case of measles in a newborn child, the mother of whom was unaffected,—having had the disease in her infancy, but it was prevailing in the house. Numerous cases are on record, in which children have had the disease at the time of, or soon after, birth, when the mother herself was at the time affected with measles. (*Düttel, Ledelius, Schurig, Rösler, Burserius, S. G. Vogel, Rosenstein, Osiander, Grätzer.*)

It does not often happen, that persons are affected with measles twice in the course of their lives; yet, such cases are observed, (*F. Home, Baillie, Rayer:*) the author has met with three or four.

The disease attacks all ages, and prevails at all seasons, yet there must be a greater predisposition to it in some than in others; for we frequently observe persons, who have never had the disease, pass through epidemics unaffected; and, again, if those same persons escape one epidemic they may not pass through another with the like immunity.

The young of both sexes are equally liable to be attacked; and the young rather than the adult or the aged. It is a disease, indeed, which so generally affects the period of childhood, that it is seen comparatively seldom at after periods. In advanced life, the frame appears to be but little impressible to it.

Pathological characters.—It does not frequently happen, that death takes place in measles during the period of eruption; and,

hence, few—if any—opportunities have occurred for witnessing the condition of the internal organs under such circumstances. Certainly, we have no authentic history of the appearances presented. It has been presumed, that if the condition of the mucous membrane of the trachea and bronchia were examined at this early period, it would probably be found more or less involved in the eruption, (*Geo. Burrows*;) but this is a mere suggestion, and not perhaps a probable one, inasmuch as in none of the eruptive diseases do we find the eruption distinct in the deeper seated mucous membranes.

When death does take place, it is most commonly owing to the supervention of other diseases,—bronchitis, pleuritis, pneumonitis, encephalitis, endoenteritis, &c.—the characteristic lesions of which will be found on dissection. Probably, from the very commencement, and in even the mildest cases, more or less inflammation would be found in the bronchial mucous membrane; indeed, this has been esteemed an essential part of the disease. (*Mackintosh*.)

Treatment.—In the milder forms of measles, but little management is necessary. During the whole of the eruptive period, there is little danger. The eruptive fever is always more or less severe, and the eruption is occasionally ushered in by convulsions. Still, by paying attention to the state of the digestive tube, confining the patient to bed, and restricting him from all excitant food, allowing only diluent drinks, the disease will generally pass through its progress without the supervention of any unpleasant symptom. Formerly, heating drinks were administered with the view of favouring the eruption; but these are now known to be worse than useless.

The cough, which—as already shown—is one of the necessary phenomena, when the disease is fully developed, is always troublesome. It is never proper, however, to give any of the so called “expectorants,” with the exception of such as are altogether demulcent and soothing. Barley-sugar, or any of the simple “candies” may be allowed; or the almond or oily emulsion; but none of these agents exert much control over the bronchitis, and, accordingly, they should not be taken in such quantity as to endanger disturbance of the stomach and intestines.

Owing to the universal presence of a certain degree of thoracic inflammation, and the danger of more, it has been urged, that bleeding should be employed in the way of prevention; but this appears an unnecessary precaution, provided the symptoms are watched carefully; and it has been by no means proved, that it answers the intended purpose. If the febrile symptoms run high, and especially if the functional phenomena and physical signs announce the presence of much thoracic inflammation, blood-letting ought to be unhesitatingly practised, and repeated if necessary.

Bleeding is borne better in measles than in the other exanthemata; but caution must always be used in pushing it far in young

children, and especially in a disease which has a definite course to run, and whose general tendency is to terminate in health.

About the period when the eruption ought to begin to decline, especial care is needed in watching the condition of the lungs. The course of the disease is now nearly run, and if, instead of the pneumonitic symptoms yielding at this time, they remain at the same point, or if *à fortiori* they become aggravated, the practitioner must treat the disease as thoracic inflammation, without regard to the preëxisting measles. Where the strength and age of the child will admit of it, blood should be taken from the arm; but where such is not the case, it may be obtained from the surface of the chest by cupping or leeching; and, in the more active cases, where general bleeding has not been practised early, and doubts exist as to its entire propriety, local blood-letting may be preferable. The most strenuous advocates for the essentially inflammatory nature of the disease, and the importance of blood-letting, consider, that when the bronchitic symptoms have been allowed to go on neglected, until the air passages are gorged with mucus, bleeding is a very questionable remedy, "and no doubt often does irreparable mischief." (*Mackintosh.*)

Along with the loss of blood, nauseants and revellents must be employed as recommended under acute bronchitis and pneumonitis; care being taken in this—as in every other—exanthematous affection in regard to the application of blisters, which ought to be permitted to remain on the part for a short time only, and never until full vesication is induced. In young children affected with these diseases, there is a tendency in the blistered part to become diphtheritic or gangrenous.

When the eruption appears imperfectly, or, after having shown itself, recedes or entirely disappears, and great distress is apparent, the observer should endeavour to discover the pathological condition that gives occasion to the phenomena. Generally, it will be found to be owing to too great concentration of action towards the internal parts of the organism. Where this is not great, it may be rectified by the use of the warm bath, which is a useful remedy in all exanthematous affections, and by hot drinks and a sinapism to the epigastric region; but should it be to a greater degree, it may be advisable, first of all, to abstract a small quantity of blood as in ordinary cases of congestive fever, and to follow this up by the employment of gentle excitants—as wine whey. In a case on record, in which the fading efflorescence became mixed with petechiæ, and there was apparently no hyperæmia of any particular internal organ, the decoction of cinchona with sulphuric acid and a little wine was administered, and the child speedily recovered. (*Bateman.*)

To facilitate the appearance of the eruption in cases of retardation or of disappearance after it has once occurred, an emetic,—especially one of a nauseating character,—has been found of service, chiefly through its equalizing influence. The tartrate of anti-

mony and potassa¹ is as effective as any that could be administered.

¹ R.—Antim. tart. et potass. gr. iv.
Aquaë, ℥ij.—M.

A dessert-spoonful to be given every 15 or 20 minutes until it operates.

In cases of malignant measles, or of those that are essentially congestive from the first, the management must be the one just laid down; and in all the sequelæ and complications, the treatment must be essentially the same as if they occurred after, or along with, the continued or any other form of fever.

During convalescence, great attention must be paid to the bowels, especially if the season of the year predisposes to erethism of the mucous membranes. In almost all cases, it may be advisable to prescribe one or two doses of a cathartic at no distant intervals. Care should be taken, also, that the valetudinarian is well clad, and that he has readily digestible and nourishing diet, with change of air, where practicable, in order to avoid the development of those strumous and tuberculous diseases, which are so apt to follow in the train of measles.

False Measles.

SYNON. Rubeolæ (of some), Roseolæ (of some), Morbilli variolosi, Scarlatina pustulosa, Scarlatina miliaris; Ger. Rötheln, Ritteln, Falschen Masern, Feuermasern, rothe Hund.

This is the affection, which—as before remarked—is termed, by the Germans, *Rötheln*. It is described as an acute exanthema, midway between measles and scarlet fever, but which belongs to neither one nor the other; for it affords no protection against either, and may recur more than once in the same individual, and after he has passed through both. (*Himly, Jahn.*) Generally, it resembles scarlet fever more than measles. (*Most.*) It is occasionally observed in this country, both sporadically and epidemically, and receives, in the ignorance of a more appropriate appellation, that of the *French measles*.

Diagnosis.—The usual characters of the disease are as follows:—For two or three days, there is slight fever; after which, an eruption appears on different parts of the body, in spots larger than measles, generally half an inch in diameter, and in the midst of which small vesicles sometimes form. In a few days—from six to ten—the red colour of these patches disappears, and desquamation ensues. The separation of the cuticle is greater than in measles, but in smaller portions than in scarlatina. The patients commonly complain of pain in the neck, and in the salivary glands; yet neither the eyes nor the nose may suffer as in measles; in other cases, however, watery discharges take place from the eyes and nose, with sneezing and sore throat. (*R. Paterson.*)

The disease is not generally of much consequence, although the febrile symptoms are, at times, severe.

Treatment.—It is but necessary that this should be simply an-

tiphlogistic, and of the same preventive kind as is necessary in cases of simple measles.

2. SCARLET FEVER.

SYNON. Scarlatina, Morbus scarlatinus, Febris scarlatina, Gutturis morbus epidemicus, Rosaliæ (of some), Rubeolæ (of some), Enanthesis rosalia, Rosalia (of some), Rossalia, Purpura (of some), Typhus scarlatinus, Febris rubra; *Fr.* Scarlatine, Fièvre rouge; *Ger.* Scharlachfieber.

The term "Scarlatina"—which is modern, and said to have been introduced into medical nomenclature by Sydenham—is employed to designate a disease, the general characters of which consist in fever, usually preceding, by a day or two, the appearance of a scarlet efflorescence of the skin, and of the mucous membrane of the mouth and fauces, with inflammation of the throat in most cases; the eruption terminating by desquamation towards the end of the first week.

Diagnosis.—Many divisions have been made of scarlet fever, in order to embrace the prominent characters of the epidemic, or of the particular case as it presents itself in any individual. The most common have been the following:—1. Simple scarlet fever—*Scarlatina simplex*—in which the fever is seldom active; the cutaneous efflorescence is complete, but there is no angina or inflammation of the throat. 2. *Scarlatina anginosa*, in which the febrile excitement is greater, the eruption complete, with considerable amygdalitis or isthmitis. 3. *Scarlatina maligna*, in which the fever is of an adynamic character with considerable depression of the vital forces; and, along with the other symptoms of scarlatina in general, a diphtheritic or sloughing inflammation of the throat, with, not uncommonly, enlargement of the salivary glands, and an acrimonious discharge from the nose and ears.

These are the main varieties depicted by writers; but, as observed of measles, every variety is scarlet fever modified by particular circumstances, as by the constitution of the patient, the nature of the epidemic, and the intensity of the affection of internal organs.

Unquestionably, there are in this disease, as in measles, two great varieties, one of which may be named the inflammatory, and the other the congestive; and subdivisions—it has been remarked—(*Mackintosh*) might be made of different combinations of these two; there is always, unquestionably, much difference between the phenomena presented by the form which is uncomplicated with sore throat and by those forms that are.

The eruptive fever of simple scarlet fever varies both in intensity and duration; sometimes, it is extremely slight; at others violent. The patient commonly complains of debility, and general indisposition, with nausea or vomiting; slight chills followed by heat of skin, and thirst; and, at times, headache, epistaxis and more or less stupor.

On the second day of the disease, according to the testimony of

most observers, the efflorescence begins to appear; the face becomes swollen, and it, as well as the neck and chest, begins to be covered with small red points or spots, which are not prominent, and are, at first, of a deeper, but subsequently of a vivid, red, separated by portions of the cutaneous surface of the natural colour. These spots gradually coalesce, so that, on the face, neck and upper extremities, the eruption is uniform and continuous; but, over the trunk, it is diffused in larger irregular patches. On the loins, nates, and the bends of the joints, it is generally of a more vivid hue than on other parts of the body.

The eruption is often attended with a roughness of surface, when the hand is passed over it, owing to the enlargement of the papillæ of the skin. At the outer and posterior part of the arms and thighs, these elevations are, at times, so considerable as to constitute the *Cutis anserina* or *Chair de Poule*. The skin is burning hot, tense, dry, and unusually sensible to the touch. The feet and hands are intensely red, and are swollen, stiff and painful. About the fourth day, the eruption is commonly at its acme, presenting the appearance of the shell of a boiled lobster, or as if the skin were dyed with the juice of the raspberry. On the fifth or sixth day, it begins to fade; the redness disappears in the order in which it invaded the skin; the tumefaction of the face subsides; and, on the seventh day, it has become indistinct. Itching now supervenes, and the desquamation commences,—large flakes separating from the hands, feet and other parts of the body.

Whilst the eruption is on the cutaneous surface, its effects are perceptible on the mucous membranes of the mouth, fauces and nostrils, all of which are of a vivid red colour. The papillæ of the tongue are preternaturally elongated, and their red points project through the white coating on the tongue; but this is not peculiar, being observed in certain cases of gastroenteritic and other affections. When the tongue is devoid of this coat, it is extremely red, the elongated papillæ giving rise to a peculiar appearance. This condition of the mouth and fauces disappears with the eruption in simple scarlet fever; the fever, too, abates at the same time, so that, at the end of about a week, the patient seems to be free from the disease, but greatly debilitated in many cases.

Such is the course of the mildest form of scarlet fever; it often happens, however, that the disease is much more violent. In the variety, for example, commonly termed *Scarlatina anginosa*, the prodromic or precursory symptoms are more severe; and often,—from the commencement—the muscles of the neck and lower jaw are suddenly affected with a kind of stiffness. On the second day, the fauces are inflamed; the voice is hoarse, and deglutition difficult and painful. The tonsils are swollen, and the mucous membrane of the mouth and fauces of a vivid red colour. The whole throat becomes covered with a thick, viscid secretion, or flakes of a pultaceous matter, of a gray, yellowish, or white caseous character, analogous to what is seen in certain inflammations of those parts

described elsewhere. They have been regarded as sloughs from ulcers, but they appear to be true exudations from the inflamed mucous membrane.

When blood is exhaled from the mucous membrane, these exudations acquire a dark colour, which gives still more the idea of sloughing ulcers, as the breath is, at the same time, offensive. The pultaceous matter can be readily detached from the membrane, but it never separates in shreds, as in the diphtheritic cynanche. It differs, too, essentially from the cynanche maligna, in there being no ulceration, no loss of substance,—the inflamed points, when cleansed by drinks or gargles, being distinctly perceptible.

The presence of the viscid secretion gives rise to constant, distressing, and, too often, to ineffectual efforts for its expulsion.

On the second, third and fourth days, the disease is generally at its extreme of violence; the pulse is frequent, but its strength is by no means equal; the respiration is oppressed; the thirst is urgent; and, towards evening, there is usually an exacerbation of the febrile movement, and not unfrequently delirium. The heat under the tongue is now very great. It is, indeed, perhaps the hottest of all fevers. The author has often marked the mercury at 106° Fahr. and it is affirmed to have been noted as high as 112° , (*Geo. Burrows*;) but this is questionable.

The eruption does not commonly appear so early in this as in the simple variety. Frequently, it is not seen until the third day, and does not so constantly extend over every part of the body. It consists of patches of a scarlet or raspberry hue, scattered over the back, flanks, neck, chest, and limbs; and almost constantly on the wrists; these patches sometimes disappear on the first day, to recur irregularly at an after period.

The inflammation of the skin is most commonly accompanied by a marked tumefaction of the subcutaneous cellular tissue, especially on the face, and on the fingers, the flexion and extension of which are impaired.

The whole duration of the eruptive stage is longer than in simple scarlet fever, and the period of desquamation takes place with much less regularity. When the eruption has disappeared rapidly, there may be little or none; on the other hand, when it has been very intense, the desquamation may continue for two or three weeks.

The febrile symptoms and the affection of the throat begin to abate with the progressive disappearance of the eruption; but some degree of febrile excitement and of sore throat may continue for a week or more after the eruption has entirely gone.

Scarlatina anginosa is very apt to be complicated with affections of some of the serous membranes—encephalic, thoracic or abdominal, and these complications are the most common cause of the fatal termination of this variety. The affection of the mucous membrane of the fauces is often, too, extended to that lining the

nose and the Eustachian tube, so as to give rise to an acrid discharge from the Schneiderian membrane, and to deafness. Many of these complications require great care in diagnosis, for they sometimes prove rapidly fatal, and are always dangerous. Unpleasant sequelæ are also to be expected from this variety, more frequently than from simple scarlet fever.

At times,—and, unfortunately, not unfrequently,—scarlet fever occurs with phenomena still more serious than those that belong to scarlatina anginosa. The symptoms are essentially those described under Gangrenous Pharyngitis, excepting, that in the latter there may be no eruption. At the very commencement, they are like those of the anginose variety: but soon the malignant character becomes indicated by fever distinctly of the typhous form, in which the encephalic functions are greatly disordered, and the heat of skin and other signs of typhus well marked. When the fauces can be inspected, they are found to present a dusky red appearance, without much tumefaction. Exudations of a dark colour are thrown out in some cases, and, in others, a true gangrenous inflammation takes place, leading to the formation of extensive sloughs. At the same time, an acrid discharge takes place from the nose; the breath is fetid; and the viscid secretion in the pharynx gives rise to a rattling respiration. In severe cases, the inflammation of the pharynx occasions so much difficulty of deglutition, that the attempt to swallow fluids causes their rejection by the nose. Diphtheritic exudations are observable on the inside of the lips and cheeks; and the cervical and salivary glands are subject to inflammatory tumefaction, which ends, at times, in the formation of abscesses.

The eruption is extremely irregular in this form, both in its appearance and duration. Frequently, it appears late, and remains out only a few hours; or it recedes and recurs several times in the course of the disease. Usually, it is paler than in the other varieties; but, in places, it assumes a deeper hue.

The typhous condition is exhibited, along with other symptoms, by the appearance of petechiæ, and a strong hemorrhagic tendency from the mucous membranes; and, occasionally and inexplicably, the large joints become extremely painful and swollen, with evidences of fluctuation. (*Tweedie.*)

In many cases, the malignant form terminates fatally on the third or fourth day; and, at times, without there being any reason to apprehend so sudden a termination. There is no safety, indeed, for the patient, until he has completely passed through the disease; nor can all apprehensions cease even then, for the sequelæ are often as important as the original affection. In those cases that terminate so suddenly and without apparent cause, no appreciable lesion may be found on dissection.

Lastly, as measles occasionally occurs without eruption, so may the scarlet fever poison—if it may be so termed—exhibit itself without the characteristic cutaneous affection. This is the *Scarla-*

tina sine exanthemate of some writers. The cause of the disease seems to expend itself on the mucous lining of the mouth and fauces, and, during epidemic scarlatina, may attack certain members of a family in this manner, whilst the others pass regularly through the disease; indeed, all the varieties, from the simplest to the most malignant, are occasionally met with in different individuals of the same family. At times, this form of the disease assumes the characters of cynanche maligna, and may prove fatal. It would appear, too, to be as capable of communicating scarlatina as the other varieties. (*Willan, Geo. Burrows, Tweedie.*)

Scarlatina can scarcely be confounded with any disease except measles; but the mode of diagnosis has already been given, when treating of the latter affection.

Allusion has already been made to the tendency in the serous membranes to become morbidly implicated in scarlatina, and to the generally serious nature of those affections. In certain epidemics, too, and in sporadic cases likewise, attacks of inflammation of the mucous membranes—as of the bronchial tubes, stomach and intestines—occur, the latter not unfrequently putting on the form of pellicular or diphtheritic inflammation. It has, also, been remarked, that effusions of fatal tendency occasionally take place into the larger joints. Gangrene likewise occurs, at times, in the extremities. One of the most serious sequelæ, however, is anasarca, appearing in the face, eyelids and lower extremities; and, not unfrequently, becoming general. Dropsy may, likewise, exist in the different serous cavities. In some epidemics, this sequela has been found more serious than the primary disease, (*Willan*;) whilst, by others, it has been regarded as an affection of no great importance. (*Sims, Wells, Cullen, Bateman, Armstrong, Philipp.*) The urine, in this affection, often contains albumen, and there is such a striking similarity between the phenomena, during life, in it and in the morbus Brightii, that it has been presumed (*Rayer*), that dissection might establish the existence of the lesion, which constitutes the latter disease. It has, indeed, been affirmed, more recently, (*Hamilton*;) that the kidneys exhibit traces of incipient disorganization; and, still more recently, a writer (*R. Willis*) has remarked, that in all the cases that he has seen within the four years preceding, which might amount to between forty and fifty, “the kidney has always been affected, if blood and pus corpuscles in the urine, a scanty secretion, and an albuminous state of this fluid, be allowed as evidences of implication of the secreting organ.” When, however, we reflect upon the number of perfect cures of anasarca succeeding scarlatina, it is more philosophical to infer, that the albuminuria consists of some functional derangement, rather than of organic disease of the kidney, especially as we know that it is often induced in this manner.

Simple scarlatina, occurring in a healthy individual, is a disease devoid of danger; yet danger may arise from the supervention of

hyperæmia, and this has always to be borne in mind. It is often indicated by the sudden recession of the eruption, as well as by its tardy or irregular appearance. A benign case occasionally, too, assumes rapidly all the characters of the congestive or malignant variety.

The extent of the pharyngeal inflammation marks, in a measure, the severity of the disease in the anginose and malignant varieties; where this is slight, the danger is less; but if the tumefaction and difficulty of deglutition be very great, the danger is in proportion. The same may be said of the gastro-enteritic, pleuritic, and meningitic affections, all of which are very serious complications. It need scarcely be said, that in all cases of scarlatina maligna, the prognosis should be of the most guarded kind. In certain epidemics, too, the disease is more fatal than in others.

The glands of the neck sometimes inflame and suppurate, so as to occasion great destruction of parts; and, at times, the tumours press upon the larynx, so that the patient dies under all the symptoms of suffocation.

There is, moreover, a form of scarlatina, which is termed the *hemorrhagic*, and which is almost always fatal. It is indicated by the ordinary signs of purpura; dark spots appearing here and there, followed by exudation of blood from the mucous membranes, of the mouth and nose especially, which is, occasionally, so profuse as to cause death. Wherever, too, a puncture has been made, it becomes the seat of hemorrhage. In one case of this kind, an abscess in the neck suddenly filled with blood, and this, making its way through a leechbite, flowed out as if from a divided artery, and destroyed the patient in a few hours. (*Professor Morton*, of Philadelphia.)

Scarlatina has been observed to attack puerperal more readily than pregnant women. At the Maternité, of Paris, it was remarked, that the disease scarcely ever attacked the latter; but they readily contracted it after delivery. (*Senn, Andral*.)

Scarlatina is certainly one of the most alarming diseases that can affect a family; and it is not uncommon for two or more to be carried off by it. It is difficult—impossible, indeed—to assign any adequate cause for the fact, but it would appear, that some families are more fatally affected by it than others; and the statistics of this city (Philadelphia), as well as of others—show, that it proves more fatal to females than to males. (*Emerson*, of Philadelphia.) The statement of deaths in Philadelphia, for the year 1839, gives 225 from scarlet fever, 109 of which occurred in males, and 116 in females; of the males 2, and of the females 4, were adults; of the whole number 10 were under one year of age; 40 from one to two years; 125 from two to five; 39 from five to ten; 5 from ten to fifteen; 2 from twenty to thirty; 1 from thirty to forty; 2 from forty to fifty; and 1 from fifty to sixty.

Causes.—Similar remarks to those made under the head of measles are applicable here. It is generally considered to be con-

tagious,—almost universally so, indeed; yet the evidences are not as strong as in the case of measles; and many persons deny altogether, that it is communicable. The author has repeatedly known it attack one member of a family, where several have appeared to be equally liable to it, and who have escaped, and yet they have, at a subsequent period, and without any knowledge of exposure, been attacked with the disease. The safe side is, unquestionably, to believe it to be contagious, and to suffer no unnecessary communion between the sick and the sound, especially if the epidemic be malignant.

That scarlet fever occurs more frequently in the period of youth than in the adult age is shown by all experience, and is proved by the statement of deaths in Philadelphia just cited. From that statement, it would appear, that the fatality is greatly diminished after ten years of age. It must be borne in mind, however, that the number attacked after that age is smaller.

It is affirmed by writers, that epidemics of scarlet fever are observed towards the equinoxes especially, and during the winter, when atmospheric changes prevail, as well as in moist, cold, and misty periods, and after copious rains followed by great heat (*Andral*); but the author has not been able to trace any invariable or even frequent sequence in these respects. That it prevails epidemically is unquestioned; but as to the nature of the epidemic influence we are wholly in the dark, nor can we account, with the least plausibility, for certain epidemics being benign whilst others are malignant.

It is probable, that the disease arises, at times, from other causes than contagion. It can scarcely be maintained, that its universal mode of propagation is by some specific miasm disengaged from an individual labouring under the disease, and that no combination of influences can now arise capable of generating it *de novo*.

Like measles, the disease rarely affects the same person twice.

Pathological characters.—On the dissection of those who have died of scarlatina, there are frequently no morbid appearances sufficient to account for the fatal event. Often, where the inflammation and ulceration of the throat have appeared to be most severe and distressing during life, dissection has shown but slight traces; commonly, the appearances of dark coloured exudations covering a dark red or livid membrane have been found,—much more frequently, indeed, than actual ulcerations. These exudations are seen extending down the lateral parts of the pharynx and œsophagus, but not into the larynx and trachea. (*Rayer, Tweedie.*)

A modern pathologist (*Mackintosh*) has, however, affirmed, that the most constant morbid appearances, met with by him, have been in the air passages, presenting inflammation in its various stages,—viz: vascularity of the mucous membrane, thickening and occasional ulceration: in two cases, he saw the epiglottis nearly destroyed by ulceration; and also “effusion of thick, tenacious matter, filling up the air passages to the bifurcation, and often lining the trachea.”

From the symptoms before described, it might naturally be expected, that inflammation and its results, should be occasionally apparent in the lungs, pleura, peritoneum, arachnoid and the serous membranes in general; and not unfrequently, also, evidences of gastroenteritis and its results.

The appearances, of course, vary materially according to the precise complication; and, in certain epidemics, particular complications are found to prevail more than in others. Thus, in an epidemic in Edinburgh, during the autumn of 1832, almost every severe case had more or less of chest affection, and there was only one fatal case, in which it was not evident, from the appearances after death, that violent inflammation had extended to the larynx, trachea and lungs. (*Hamilton.*)

Where the secretion of urine is albuminous, the kidneys may, or may not, exhibit evidences of the morbid condition witnessed in Bright's disease.

Treatment.—The greatest discrepancy has prevailed in regard to the management of scarlet fever, and this has been mainly owing to the difference in the character of the particular epidemic; for it will be found, that whilst a certain course is the most successful that can be pursued in one epidemic, it may be wholly or mainly ineffectual in another. We can hence understand the conflicting views of therapeutists; some advising the free use of the lancet, whilst others have recourse to excitants even from the commencement. This, however, only accounts for a part of the discrepancy, for even in the same epidemic we meet with the most opposite plans of management advised by different practitioners.

In the most simple form of scarlet fever, all admit, that but little treatment is necessary. The patient should be confined to bed, attention be paid to the state of the bowels, and the antiphlogistic regimen be rigidly enforced. When the heat of the surface is very great, the face, legs and arms may be sponged with cold water, or with cold vinegar and water,—the rule being, to employ cold ablution when the skin is steadily hot and dry; but if any chilliness be experienced, the water may be tepid or warm instead of cold. In like manner, as long as the febrile heat is great, ice may be allowed freely; and a more agreeable febrifuge cannot be prescribed than the ordinary soda or mineral water of the shops, which may be put up in one ounce vials, and one be allowed every three or four hours, or when the thirst is urgent.

In strong plethoric subjects, and where the character of the epidemic does not appear to contraindicate it, blood-letting may be practised with the view of preventing hyperæmia in internal organs. It is important too, to watch attentively the simplest case, particularly at the period of the subsidence of the eruption, when there would seem to be greater danger of internal hyperæmia, or of the supervention of anasarca. In the variety described as scarlatina anginosa, there is local inflammation, and fever generally in a ratio therewith. It is in this form, that we witness great dis-

crepancy as to whether the abstraction of blood should be freely or sparingly employed, or be altogether dispensed with: commonly, perhaps, the state of the vital forces will not bear general bleeding, and, therefore, it should be used with exceeding caution. Local blood-letting, by means of cups behind the neck, or of leeches to the throat, may, however, be practised with great advantage, and it has been advised to scarify the tonsils themselves, which is, doubtless, the best form of local blood-letting, in the case of the adult, but can rarely be practised in children. After leeches have been applied, an emollient cataplasm may be put around the neck.

It is in cases of visceral inflammation, that the necessity most frequently arises for the vigorous use of bleeding and other antiphlogistics; but it must be borne in mind, that the inflammation constitutes a complication to a very peculiar disease, and one that requires the exercise of the greatest discrimination to decide how far antiphlogistic measures should be carried. In the disturbed state of the encephalic functions, which so often attends this anomalous disease, we frequently recognize—it has appeared to the author—a condition very different from that which is produced by active inflammation or hyperæmia of the encephalon. The encephalon appears rather to be exhausted by the unwonted activity of the portion of the nervous system concerned in the excited function of calorification; and, accordingly, in many such cases, the use of diffusible excitants has been found serviceable,—the delirium or the coma gradually disappearing as the system begins to feel their influence. This practice has, indeed, been adopted in scarlet fever accompanied by such signs of encephalic disorder, and with great success, (*Baer*, of Baltimore,) and it has been followed by similar results in some cases that have fallen under the author's care. (See his *General Therapeutics*, p. 405, Philad. 1836; and *T. F. Cornell*, of New York.)

By many, emetics have been advised, at the commencement of the anginose variety especially, to cut short the disease; but they usually fail in this, as the disease must be considered to be self-limited; and they are not much employed. Great diversity of sentiment has, likewise, prevailed in regard to the employment of cathartics; there can be no question, however, that the bowels should be kept open by those of a gentle kind, as by rhubarb and magnesia,¹ epsom salts and magnesia,² or castor oil, (ʒij.); but active purging is very rarely—perhaps never—advisable.

¹ R.—Pulv. rhei, gr. x.
Magnesiæ, gr. xv.
Ol. carui vel anisi. gtt. iv.—
M.

² R.—Magnes. sulphat. ʒss.
Magnes. carbonat. ʒiiss.
Aquæ menthæ, ʒiij.—M.
One half for a dose, to be repeated in
two or three hours if necessary.

The internal use of the vinum colchici has been found to exert a most salutary influence in inflammatory scarlatina, according to the experience of one practitioner, (*Tait*;) the dose to children from four to six years of age being three or four drops given every three

or four hours. In most of the cases, blood-letting—general and local—was had recourse to; in others, local blood-letting only; and it was remarked, that the effects of the colchicum were always most apparent after the abstraction of blood. Mr. Tait remarks, that in one epidemic, he only lost one patient in 126; whilst others lost one in five or six,—an enormous difference; so great, indeed, as to lead to some suspicion of inaccuracy in the statistical results.

The refrigerant plan of treatment, recommended under scarlatina simplex, must be pursued in this variety, with the precautions there laid down. At one time, it was the custom, at the commencement of scarlatina, as of typhus, to endeavour to cut short the disease by the affusion of cold water on the naked surface, (*Currie*;) and the late Professor Gregory of Edinburgh, who was never slow to adopt any improvement, was the first in Scotland to practise it on his own children. The results were satisfactory to him,—the disease being certainly mitigated; but the shock is at times so great as to lead to the belief, that injurious and even fatal consequences may have followed its employment, and cold ablution has, therefore, been substituted. Taken singly, this is perhaps the most effectual remedy that can be employed in the inflammatory varieties of scarlatina, and induces the same soothing influence as in other forms of fever. The chloride of soda, or the chloride of lime, or the aqua chlorini, is sometimes added to the water. (*Jackson*, of Northumberland, Pa., now of Philadelphia.)

The same agents have been used in gargles, but the most common, perhaps, is the muriatic acid gargle,¹ which is grateful, and removes the viscid exudation.

¹ R.—Acid. muriat. gtt. xxx.
Mellis, ℥ij.
Aquæ, ℥vj.—M.

In very young children, it may be applied by means of a mop—formed of a piece of sponge or linen rag tied to the end of a stick; but it is doubtful whether the fatigue and annoyance induced by it do not more than compensate for the benefits. The soda water given as before advised, or the simple effervescing draught, made either of lemon juice and the carbonate of soda, or of tartaric acid (gr. x.) and carbonate of soda (gr. xv.), cleanses the fauces, and is, at the same time, refreshing, especially if the water be at a low temperature. There is an objection, however, to the citrate of soda or the tartrate of soda formed, that if taken very frequently it may act on the bowels—an objection, which does not apply to the simple soda water of the shops. The aqua chlorini has likewise been advised internally, (*Braithwaite*, *Pfeuffer*, *Wendt*, *Kopp*, *Trusen*;) but it is not much employed. It would seem to be more appropriate in cases of scarlatina maligna.

It has been thought by a practitioner of some eminence, but not devoid of exclusiveness in his views, that the best gargle is a little warm water, and he particularly cautions young practitioners

against attempting to syringe the throat of a young child. (*Mackintosh*.)

After the subsidence of the fever and the disappearance of the eruption, still more care is needed than in cases of simple scarlet fever. The debility is so great, that it has been proposed to put the patient on a nutritious diet, and to allow tonics. These must, however, be administered with all due care, as the sequelæ of this variety of scarlatina are rather those of inflammation than of debility. Still, tonics that do not manifestly excite, as any of the ordinary vegetable bitters—the calumba, gentian, or prunus virginiana, or the cold infusion of cinchona—may occasionally be prescribed with advantage.

It remains to treat of the management of the most formidable variety of all—the scarlatina maligna. The accompanying fever is here of the adynamic cast, and often the symptoms are those of congestive typhus. In the latter case, it may be advisable to draw blood sparingly, and at the same time to administer gentle diffusible stimuli, as has been advised in the congestive forms of fever. If the fever be considerable at the onset, and there is much inflammation of the throat, leeches may be applied; but even the local abstraction of blood has subsequently to be employed with caution. The inflammatory symptoms generally, indeed, pass away in a short time, and those of depression follow. It is not often, also, that the heat of skin is so great as to allow of cold sponging; and if cold and moisture be had recourse to at all, the water should be tepid or warm. If chilliness be excited, the irregularity of function is apt to lay the foundation for internal hyperæmia, or to increase it, if it already exists.

The general plan of treatment, recommended in the anginose variety of inflammation, is advisable here: emetics have been recommended by some, (*Bateman, Tweedie*;) but it is not easy to see what important benefit can result from their use, except in regard to the exudations from the throat, which they may clear away. Their operation, however, fatigues, and no essential amelioration of the symptoms is produced by them.

In regard to the treatment of the affection of the throat, the same remarks are applicable as were made on scarlatina anginosa. Gargles are certainly not of much service, and they harass greatly. The chlorides have been used extensively, and one of the most employed in this country is made of the capsicum or Cayenne pepper.

R.—Pulv. capsic. ʒj.
Sodii chlorid. ʒj.
Aceti, ʒiv.
Aq. ferventis, ʒvj.—M.

The infusion of black-oak bark and of green tea have been equally used for their astringent properties.

When the glands of the neck, or the tonsils, are much tumefied, and there is difficulty of breathing in consequence of the exuda-

tions from the diseased membrane, or the existence of actual sloughs, it has been proposed to apply blisters to the neck; but if they be employed at all, they should only be kept on until they excite rubefaction, owing to the tendency before mentioned, in the surface of the derma to become diphtheritic or gangrenous. As good an application as any, in these cases, is a simple emollient cataplasm, or one to which a portion of flour of mustard has been added. Should suppuration take place, the matter must be evacuated early, to prevent extensive sloughing of the integument of the neck.

After the disease has passed through the eruptive stage, or should the symptoms indicate their use at an earlier period, it may be necessary to support the system, by the administration of any of the simple bitter vegetable tonics, or the cold infusion of cinchona, or of the sulphate of quinia, which may be given freely. In many cases, too, as before observed, positive advantage is to be derived from the free employment of stimulants, as of wine whey, or of wine and water, given at frequent intervals. The farinaceous preparations, as sago, arrow-root, or beef tea may be directed, taking care not to overload the stomach; and if the skin be cool, and the pulse feeble, the existence of delirium or coma, instead of counter-indicating, may still more suggest, the use of excitants.

As in other adynamic cases, the carbonate of ammonia is often employed; but neither in this, nor in other similar conditions has the author observed marked benefit from it. It has appeared to him much inferior to wine whey.

The dropsical effusions, which succeed scarlet fever, almost always require the antiphlogistic management. (*R. Willis.*) They are generally accompanied by marked evidences of vascular excitement, and have been found to yield promptly under the use of the lancet. (*Stewart*, of New York.) In other cases, however—and most commonly perhaps—they do not require the use of the lancet, and generally yield to brisk cathartics, given about twice a week, and to diuretics,—the general treatment, indeed, which is demanded in hydropic effusions when of the active kind; it being borne in mind, that the kidneys have often been found diseased in these cases; and hence, that all over stimulation of those organs by too powerful diuretics cannot fail to be prejudicial. The idea of some, that these secondary dropsies are always dependent upon, or connected with debility, and, therefore, that they ought to be treated by tonics, ought certainly to be deprecated; but equal caution should be entertained in regard to the too vigorous use of depleting agents.

The case given by a modern pathological writer (*Mackintosh*), ought certainly not to be taken as the rule of action in all cases. "Dr. Lewins was called to see a little patient of mine, who, after scarlatina, had dropsy with coagulable urine. Convulsions suddenly appeared when he was much debilitated. Dr. Lewins opened a vein, and allowed the blood to flow, till the boy (whose age was ten years) was relieved; the blood weighed two pounds.

No debility followed, and the boy, from that time, made a rapid recovery, and has ever since been healthy."

After the disappearance of the eruption the various affections, already referred to—viz. inflammation and suppuration of the glands, inflammation of the middle ear with fetid discharge from the meatus auditorius externus, and closure of the Eustachian tube, have to be treated according to rules laid down elsewhere.

In the case of a disease so alarmingly fatal, it is not astonishing, that efforts have been made to prevent its extension, or to diminish its fatality. Many years ago, it was proposed by a respectable practitioner (*Macmichael*), to choose a favourable epidemic, and to expose children, who had not had the disease, freely to it. The proposition was not unphilosophical; but conflicting as it did with the feelings of relatives, it was not likely to be extensively adopted. Few mothers could be prevailed upon to expose their offspring in this manner, especially as it is well known, that even in a favourable epidemic, cases may nevertheless prove fatal.

A great source of anxiety during the existence of an epidemic, especially if it be unfavourable in its character, is either to destroy the miasm—contagious, if it be so—or to steel the system against its influence. With the view of destroying any miasm, or to avoid undue exposure, the different disinfectant agents, and especially the chlorides, have been freely used in apartments, and especially about the sick; great attention has, at the same time, been paid to the diet, and to the condition of the bowels of those that are well; and they have been kept at home as much as possible when the epidemic has been raging.

Yet all these precautions have been found insufficient; and the frequency, with which the disease attacks children even when perfectly isolated, has thrown great difficulty in the belief of its being occasioned by any contagious miasm.

With the view of steeling the constitution against the morbid cause, the use of the belladonna was proposed, between thirty and forty years ago, by the founder of the Homœopathic system. (*Hahnemann*.) Hahnemann affirmed, that when given in small and repeated doses, it produced heat and dryness of the throat, swelling of the submaxillary glands and a cutaneous efflorescence. He thence inferred, that this medicine, from its producing symptoms analogous to those of scarlet fever, might prove a preventive against the infection of the latter.

That such an efflorescence of the skin, with pain and redness of the throat, is induced by it, has been deposed to not only by homœopathists but by others, (*A. T. Thomson, Geo. Burrows*;) but the author has never witnessed it; nor would the eruption seem to have been esteemed necessary when the belladonna has been given as a prophylactic. The testimony in favour of its being possessed of prophylactic powers in scarlatina is considerable, (*Dusterberg, Berndt, Hufeland, Koreff, Thiébaud*;) and it is asserted by a recent writer (*Maclure*), that at a discussion in the

Harveian Society in 1833, the probable efficacy of the practice was admitted by some distinguished individuals. (*Sir David Barry, A. T. Thomson, &c.*)

During the prevalence of different epidemics of scarlet fever, the author has endeavoured, although not on an extensive scale, to test the efficacy of the belladonna in this respect; nor has he felt at liberty to discard the evidence because the proposition originated in the views professed by Hahnemann and his followers. It need scarcely be repeated, that the efficacy of preventives cannot in any case be readily established, because, granting that the individual escapes, it would still remain to be shown, that he would necessarily have had the disease, if he had not taken the presumed prophylactic. All the author can say is, that none of the children to whom he has administered it, did take the disease.

A writer of reputation on diseases of the skin, (*Green*), is disposed to consider the question almost settled. "Whatever," he says, "be the view taken of the manner in which the atropa belladonna acts, there seems little room to doubt of its prophylactic powers in scarlatina; those who have taken this medicine, generally escaping the disease altogether, or, if they do become affected, having it in the mildest possible form." The common mode of administering it is, to dissolve three grains of the extract of belladonna in one ounce of distilled water. Of the solution three drops are given twice a day to a child under a year old; and one drop more for every year above that age. It is asserted, that even these minute doses have brought out an eruption similar to scarlet fever.

If the belladonna really possesses any anti-scarlatinous virtues, this can only be tested by experiment, which, by the way, alone established the anti-variolous power of the vaccine virus,—a power, long contested with much obstinacy by many, until the evidence became overwhelming. "Such a simple means of escaping entirely, or mitigating the violence of so serious a disease as scarlet fever"—observes the writer already cited—"is always worthy of a trial. I had very lately an opportunity of witnessing the good effects of this medicine among the children assembled at a boarding school, where scarlatina broke out; four of the children, who were placed under my care, and to whom I prescribed the belladonna, escaped entirely, whilst amongst the others, to whom no prophylactic remedy was given, the disease spread so extensively as to cause the temporary suspension of the business of the establishment." (*Green*.)

Until experiment shall establish the powers of the belladonna in this respect, it is of course of moment, that along with it the ordinary precautions, before inculcated, should be carefully taken. The great danger, indeed, of all reputed prophylactics consists in the confidence they occasion, so that persons are apt to expose themselves more heedlessly to the causes than they would otherwise be led to do.

In regard to the period at which scarlet fever becomes commu-

nicable—if it be communicable at all—the same remarks apply as to measles. It is probably communicable from the very commencement of the eruptive fever, until desquamation has been completed; nay, it is affirmed to have been communicated by a person several weeks after the period of desquamation; but these cases are apocryphal. Many, too, believe, that it is so virulently communicable, that clothing, furniture, &c., may convey it, and for a long time after they could have received the miasm from the possessor.

The period which elapses between exposure and the breaking out of the disease is variously stated, from one day to ten. It is uncertain. In one case, in which the disease seemed to be produced by inoculation, seven days elapsed before the appearance of the eruption. (*Rostan, Geo. Burrows.*)

3. NETTLE RASH.

SYNON. Urticaria, Febris urticata, Urticaria porcellana, Enanthesis urticaria, Uredo, Scarlatina urticata, Purpura urticata, Porcellana, Exanthema urticatum, Epinyctis pruriginosa, Essera, Aspretudo, Uredo porcellana, Papulæ cuticulares; *Fr.* Urticaire; *Ger.* Nesselsucht, Nesselfieber, Porzellanfieber.

Diagnosis.—This is by no means an uncommon eruptive fever; and is essentially characterized by long prominent patches, or wheals, of various sizes, and irregular shapes. The elevations of the surface are usually of a red colour, with white wheals on the surface; at times, however, there is little or no redness, and the elevations are paler than the rest of the surface. In all cases, there is more or less sensation of burning, and very troublesome itching, especially when the patient gets warm in bed.

The eruption is usually preceded by manifest signs of gastric disturbance,—such as nausea, and at times vomiting; loss of appetite, thirst; coated tongue; and, almost always, more or less febrile excitement. Occasionally, indeed, the skin is extremely hot and dry, and the pulse very quick and active. After the eruption has appeared fully, the fever usually abates, and the main irritation is that occasioned by the troublesome heat and itching, which compels the patient to scratch; when each movement of the extremity of the fingers is frequently followed by the eruption, which marks their progress.

As many as six varieties of urticaria have been described by *ex professo* writers on cutaneous diseases, (*Willan, Bateman;*) but there seems to be no practical necessity for so much subdivision.

The disease is very irregular in its course, and in the functional phenomena that attend it; being, at times, accompanied with so little constitutional irritation, that it seems to be entirely local; whilst, in other cases, as before remarked, the pyrexial symptoms are very severe.

Occasionally, too, it disappears and recurs at uncertain intervals, and, in those strongly predisposed to it, the eruption appears, whenever the stomach is manifestly disordered. This form of the dis-

ease is sometimes very obstinate; continuing, at times, for months, and even years.

Causes.—The disease can very frequently be traced to a disordered state of the stomach. There are certain articles, indeed, which in particular constitutions or idiosyncrasies occasion it. Shell-fish, for example, induce it invariably, in some persons, and may do so in all, provided they have been kept too long; or a predisposition exists in the individual at the time. The lobster, the crab, and the mussel; certain kernels, too, and especially the bitter almond; mushrooms, cucumbers; salad and even oatmeal, vinegar and honey have induced it. The author has known several persons, who were unable to eat raspberries without the supervention of urticaria, and there are those who can take raspberries and cream with perfect impunity, and who are sure to suffer, if the cream be omitted. One of the most severe cases of urticaria which the author has seen, was produced by a tablespoonful of new milk. The patient was a strong, healthy man, but, owing to idiosyncrasy, he was unable to take this article of diet, so harmless to most persons.

There are certain medicines, too, whose free use causes the same disorder, especially in particular constitutions,—the balsam of copaiba, cubebs and the turpentine, for example.

It has been suggested, (*Mackintosh*,) that individuals who are subject to urticaria, and diseases of a similar nature, during youth, are those who, in after life, are liable to be affected by gout. The author has not noticed this.

Treatment.—When nettle rash has been caused by any article of diet, which disagrees with the individual, it may be well to administer a gentle emetic. (*Pulv. ipecac. gr. xv—xx.*) In almost all cases, whether an emetic be indicated or not, it will be advisable to give gentle cathartics.

R.—*Pulv. rhei, gr. iij.*

Magnesiae, gr. v.

Pulv. zingib. gr. ii.—M.

One of these powders to be given three times a day.

Although the febrile symptoms at times run high, it can be rarely necessary to have recourse to blood-letting; yet no hesitation should exist, if the symptoms appear to demand it. In such cases, the blood has generally been found to be buffy. It has been recommended, (*Green*,) that in the common febrile nettle rash, should the eruption appear upon any one region more than another, the parts should be bathed with a cold acetate of lead or subcarbonate of potassa wash; which, it is said, will generally be grateful; yet danger would appear to proceed at times from the repulsion of the exanthem. (*Mackintosh*.)

It is, of course, indispensable to be careful as to diet, and especially to avoid any article which is known to disagree, and especially to produce the disease in question.

In the chronic form of the disease, equal attention to diet is

requisite, and excitant aliments and drinks of all kinds should be avoided. Where the gastric functions are in a state of atony, it may be advisable to unite charcoal and magnesia as a tonic and aperient.

R.—Pulv. carbon. ligni, gr. xv.

Magnesiae, gr. v.—M.

To be taken three times a day, an hour before each meal.

The cold infusion of bark, acidulated or not, by means of the dilute sulphuric acid,¹ is also useful, especially if the eruption assumes anything like the intermittent type.

¹ R.—Infus. cinchon. ℥vj.

Acid. sulphur. dilut. gtt. xxx.—M.

Two tablespoonfuls, three times a day.

In such case, the sulphate of quinia may be administered,¹ or arsenic, (*Liq. arsenic.* gtt. viij. ter die.)

¹ R.—Quiniæ sulphat. gr. iv.

Acid. sulphuric. dil. gtt. xx.

Aquæ, ℥ij.—M.

Dose, a third part, three times a day.

Usually, the disease is of very little consequence, and often disappears without the use of any remedies. It has been properly remarked, indeed, that much more depends upon the patient himself than upon the remedies which a physician may prescribe. "The patient must find out by experience the articles of food which disagree with him, and he must have sufficient resolution to avoid them for a time. (*Mackintosh.*)

The hot air or vapour bath has been advised in chronic cases, (*Green, Schedel,*) but neither can be often required.

4. ERYSIPELAS.

SYNON. Ignis sacer, Ignis Sancti Antonii, Rosa, R. volatica, Emphlysis erysipelas, Febris erysipelatosæ, F. erysipelacea, Rose, St. Anthony's Fire; *Fr.* Erysipèle, Feu St. Antoine, Feu sacré, Mal St. Antoine; *Ger.* Rose, Rothlauf.

This disease is characterized by redness of the skin, which has a shining appearance; tumefaction of the integuments, with a sensation of tension, and peculiar smarting and heat, which may be accompanied, or not, by marked fever. When pressed upon by the finger, the redness disappears, but speedily returns as the pressure is withdrawn.

It is a very common affection, and usually attacks the parts that are exposed to the air; hence erysipelas of the face is by far the most common form. (*Andral.*)

Diagnosis.—The prodromic or premonitory symptoms are those of febrile and inflammatory diseases in general, and the intensity of these generally bears some relation to the severity of the attack. After an uncertain period, a more or less circumscribed redness of the surface is observed, with swelling, tension, pain and heat, which indicate unequivocally the nature of the affection. The redness

is, at first, restricted to a small space,—to the tip of the nose, for example, in many cases of erysipelas of the face, whence it spreads centrifugally, over a greater or less surface, so as to form a patch with very irregular margins. The shade of red often varies in the course of the disease; and, as before remarked, it disappears when pressed upon by the finger, and recurs when the finger is withdrawn. This, however, is more or less the case with every form of inflammation that involves the skin.

The pain in erysipelas is not often very acute, but is rather annoying, and frequently accompanied by troublesome itching; and the sense of heat is at times pungent and scalding. The least contact augments the irritation in the inflamed part.

About the third or fourth day of the disease, the cuticle covering the inflamed surfaces is frequently raised by small vesicles, owing to the effusion of yellowish serum beneath it; these usually burst sooner or later, so that the surface becomes covered with a crust. This appearance has given rise to a division of erysipelas, termed the *bullar* or *phlyctenoid*, but, as has been properly remarked, in regard to the varieties that have been made of erysipelas, all unnecessary divisions of diseases are useless in theory, and injurious in practice. (*Mackintosh.*)

When the disease is of a highly inflammatory character, and invades the parts beneath,—it has been usually termed *Erysipelas phlegmonodes*; when accompanied with phlyctenæ, and the inflammation terminates in gangrene, *Erysipelas gangrænosum*; and when associated with the effusion of fluid into the subcutaneous cellular membrane, *Erysipelas œdematosum*. The disease, too, is more or less inflammatory according to the condition of the constitution; hence, when the febrile symptoms are those of ordinary inflammation, the disease may be simple or phlegmonoid; whilst, if the powers of the constitution be enfeebled from any cause, and especially from hard drinking, so that the fever is typhoid, there may be a strong tendency to a gangrenous termination.

The most favourable and the most usual termination of erysipelas—speaking generally—is by resolution. The inflammatory phenomena gradually decrease; the redness disappears and is replaced by a shade of yellow; and the cuticle, which had been overstretched, desquamates, either in the form of a whitish scurf, or of shreds of larger size. It must be borne in mind, however, that erysipelas is one of the “changeable phlegmasiæ;” and that it may disappear from one part and present itself in another; returning also to its former seat many times before it finally disappears. This tendency applies to the disease generally, yet when it does shift its seat, it has been termed the *Erysipelas erraticum*. The metastasis may take place to internal parts, as where the exanthem leaves the face, and affects the meninges of the brain.

When erysipelas attacks the face, the first evidence may be a slight redness at the tip of the nose, which is manifestly tumefied; thence the eruption spreads, and the swelling becomes at times so

great, that the features cannot be distinguished,—the cellular tissues of the eyelids, lips, cheeks and ears admitting of ready infiltration. The constitutional symptoms consist of general febrile irritation,—sometimes inflammatory, at others typhoid, and, at others, not markedly either the one or the other. Generally, there is considerable cephalalgia; sleeplessness, and more or less delirium, and, at times, positive meningitis. When the erysipelas invades the hairy scalp, the redness is not great, owing, perhaps, to the inflammation being chiefly seated in the subcutaneous cellular membrane; but the scalp is exceedingly painful to the touch. Occasionally, suppuration takes place and even gangrene. Portions of the scalp slough away, and destruction of the pericranium ensues, leaving the bones exposed. In other instances, the cellular membrane surrounding the parotid and cervical ganglions suppurates. (*Schedel, Green.*)

Erysipelas of the extremities is, at times, slight; at others, severe, and involving the deep-seated parts, so as to occasion extensive sloughing. The constitutional irritation is, occasionally, excessive and overwhelming. When the affection appears to spread from within outwards, and is induced by disease in the deep-seated parts, it has been termed *erysipeloid*, (*Dupuytren*), and is altogether a surgical affection.

Causes.—Erysipelas may occur in persons of all ages. It has been seen in the new-born infant, (*Bromfield, Goldschmidt, Lorenz, Girtanner, Mackintosh*), and in advanced life. It unquestionably, however, occurs more frequently in those of particular constitutions or predispositions,—and it has been affirmed, but on insufficient grounds, “in those who are liable to affections of the skin, to gout, and who are subject to disorder of the stomach and bowels.”

It may be caused by the action of external agents;—by all those that can induce erythema—as by irritating and hot substances applied to the skin. Burns and scalds, when to a certain degree, are inflammations of the skin or forms of erysipelas. Yet some have separated the inflammation of the skin, which is induced in this manner, from the erysipelas, which they affirm, must always be dependent upon constitutional causes. This, however, is mainly an affair of definition. Whether a person be predisposed to erysipelas or not, he will have it induced by irritating agents,—such as those already referred to, as well as by cantharides, mustard, &c.; but there may be some advantage in regarding these as belonging rather to erythema,—which, by the way, is esteemed by many as the simplest form of erysipelas, (*Rostan*)—whilst we look upon erysipelas as always requiring a constitutional predisposition, which gives occasion to the development of the exanthem in one person under influences that would be wholly inoperative in another. Such, indeed, is the view of a distinguished modern pathologist, (*Chomel*), who maintains, “that erysipelas is never the result of an external cause; or, at least, if an external cause concurs in its

production, it has but a secondary agency in its development. There must be the concurrence of an internal cause, of a particular predisposition unknown to us;”—and after referring to various causes, that have been imagined by different individuals, he adds; “if we endeavour to know the causes of this singular predisposition, by comparing the circumstances in which it exhibits itself, we most commonly find nothing that can explain it, and are obliged to refer it to individual predisposition,—that is to an unknown cause.”

It appears in all seasons; but in spring and autumn—it is affirmed—most frequently. The disease is more apt to supervene on wounds of the head, whether from accident or art; and it has been already remarked, that it occurs spontaneously more frequently on the head, but slight constitutional predisposition in these cases being required for its development; in some persons, too, the predisposition is so great, that traumatic erysipelas is produced by the slightest agencies. The intemperate,—they who have been accustomed to the daily use of alcoholic potations, or who—like the draymen of the British metropolis—are allowed large quantities of porter or ale daily,—are especially liable to it. A scratch of a pin will sometimes induce in such persons erysipelas very difficult of cure.

Erysipelas appears to prevail, at times, epidemically. It certainly occurs endemically or endemico-epidemically; for we occasionally observe it in hospitals, attacking almost every one in the surgical wards, and causing the surgeon to hesitate to perform operations that are not indispensably necessary, under the fear that the wound may be attacked by it. In these cases, the spread of the affection must be either owing to the inmates of the ward being exposed to the same influences, which cause in them the requisite predisposition; or it must extend by contagion. The pathologists of the European continent generally discard the latter agency; and a recent writer, (*Andral*,) considers, that the view has but few supporters except in England; “that it does not bear examination, and is every day contradicted by observation.”

When once in the wards of an hospital, it is extremely difficult to get rid of it; and it is the source of much anxiety to the surgical attendant.

It must be admitted, that the causes of erysipelas are sufficiently obscure; and that it occurs sporadically as well as epidemically, from influences that cannot, in the existing state of knowledge, be accurately appreciated.

Pathological characters.—When a part, that has been affected with erysipelas, is cut into after death, it will be found to have lost much of the redness, but not of the tumefaction. A bloody serum exudes from the subcutaneous cellular substance, or, if the inflammation has gone on to suppuration, pus will escape, but it is not usually like that of an abscess occurring in a person of otherwise good health. It is rather sero-purulent, and has, at times, flakes

of coagulable lymph in it. In very extensive affections, the mischief is proportionate; and, according to the precise pathological condition, there may be death of parts, or evidences of phlebitis; and a puriform fluid may be found in both the veins and lymphatics. (*Mackintosh.*)

In most cases of fatal erysipelas; extensive mischief is likewise met with in the serous membranes of the great splanchnic cavities; and, in many cases, the mucous membranes have been greatly involved. The author, just cited, regards them as being most frequently found in a state of inflammation; and he affirms, that in many instances, the fatal termination has been distinctly traceable to bronchitic inflammation. (*Mackintosh.*)

Treatment.—In slight cases of erysipelas, not much attention is needed in the administration of internal remedies. It may be sufficient to keep the patient at rest, to make him adopt the antiphlogistic regimen, and to prescribe saline cathartics—as the sulphate of magnesia. If the disease, however, be severe, more active remedies may be needed, such as general blood-letting, cathartics, and antimonials, in full doses.

R.—Antim. et. potass. tartrat. gr. iv.

Mucilag. acaciæ, ℥iij.

Aquæ, ℥vj.—M.

Dose, a fourth part, four times a day.

Nor should the practitioner be deterred from the employment of the lancet at the early stage of the disease, although typhoid symptoms should present themselves, unless careful consideration of the powers of the patient, and of the prevailing epidemic influence, should contra-indicate it. In young and active individuals, the abstraction of blood should be copious, in order to make a decided impression on the disease at the outset.

Next to general blood-letting may be placed the application of leeches, which may be demanded where apprehensions are entertained in regard to general bleeding, or in addition to it. The leeches should be applied over the inflamed part, not around it, as advised by some. When placed on the seat of inflammation, they draw blood immediately from the over-distended capillaries, which, of itself, ought to be salutary; but, besides this, the evacuation of the capillaries, and the irritation produced by the leech-bites, may excite their tone, prevent subsequent distension, and thus remove the hyperæmia. On the other hand, when the leeches are applied around the inflamed part, they cannot empty the affected capillaries, and by attracting blood into the neighbouring vessels, they may occasion a greater afflux towards the capillaries concerned in the inflammation.

The number of leeches must be regulated by the powers of the patient and the character of the disease. The author is in the constant habit of applying them in erysipelas, and he has not once seen the dreaded effects of ulceration or mortification ensue; and the same has been the observation of others. (*Mackintosh.*)

In erysipelas of the face, where the patient is young and active, it may be first advisable to bleed, and afterwards to apply fifteen to thirty leeches—one half the number behind each ear.

Where the powers are less active, it may be sufficient to adhere rigidly to the antiphlogistic treatment, without either using the lancet or leeches.

Emetics have been highly extolled, especially in cases of the disease that are accompanied by gastric disorder,—the revulsion and equalization they induce sometimes breaking in immediately on the morbid action. (*Chelius, Liston.*)

The author is rarely in the habit of applying any topical remedies to the inflamed part. He has found marked advantage, however, from carefully excluding the air from it, by covering it with carded cotton, as in cases of burns and scalds. (*Reynaud.*) The chloride of lime has, also, been highly recommended,¹ applied by means of folds of linen.

¹ R.—Calcis. chlorid. ℥j.
Aquæ, Oij.—M.

In the phlegmonous form of the disease, it has been advised to make free incisions through the inflamed integuments down to the fasciæ of the muscles, (*Copeland Hutchinson, Lawrence,*) so as to completely unload the over-distended vessels and fibres, and to admit of the discharge of any effused serum or purulent matter. No means are more effectual—it is asserted by their advocates—to afford present relief, and to prevent the formation of abscesses, or the supervention of gangrene. Should any of these events occur, the disease passes into the domain of Surgery. It is, indeed, in every form, placed by many in the domain of External Pathology.

A recent writer (*Velpeau*) has employed the sulphate of iron with advantage as an application to the inflamed part. He uses it both in solution¹ and ointment.²

¹ R.—Ferri sulphat. ℥j.
Aquæ, Oj.—M.

² R.—Ferri sulphat. ℥j.
Adipis, ℥j.—M.

M. Velpeau affirms, that the former exerts more control over the inflammation, generally subduing it in two days.

Lead water and cold water—even iced water—have been advised by many; and, to allay the troublesome itching, and the irritating effects of the air, it has been advised to wash the parts frequently with flaxseed, or infusion of slippery elm; but, as already remarked, the author is in the habit of treating the disease constitutionally, leaving the part in quietude, and removed from all irritation. Dusting powdered starch over the surface sometimes allays the acrid heat, and forms a coating against the air; but care must be taken, should vesicles form, that the exuded serum does not cause a crust, which might be the source of serious irritation.

The application of mercurial ointment to the inflamed parts has been proposed, (*Professor Dewees*, of Philadelphia,) and it has been extensively used; but the author has not been able to notice any

better effects from it than from greasy applications in general; all of which seem, at times, to aggravate rather than relieve.

Compression has, occasionally, been of speedy and permanent benefit,—the pain, caused by it, being very transient, (*James Allan*;) but it would seem to be more appropriate in after-stages of the disease, and especially in cases of less acuteness, which are accompanied with more œdema than usual. (*Green*.) It has been affirmed, indeed, (*Schedel*,) that it involves the danger of inducing gangrene, “and as it can only be employed at the commencement of an attack, when the efficacy of antiphlogistic remedies is incontestable, it would not be justifiable to waste time upon an experiment generally futile, and often pernicious.”

Such is not the result of the author's observation. He has often employed methodical compression in erysipelas, and has frequently found it to be not “futile” but efficacious, and in no instance has he noticed any pernicious consequences.

Blisters to the erysipelatous part have been strongly advised, (*Professor Physick*, of Philadelphia,) and they are frequently productive of good effects. In these cases of tegumentary inflammation, a dilated and atonic condition of the extreme vessels generally, if not always, exists, which the stimulation of the vesicatory is often successful in removing. There are cases, too, in which the new action, induced in the skin by drawing the moistened extremity of a stick of nitrate of silver around—but at a short distance from—the diseased integument, has succeeded in restricting the spread of erysipelas. It is but proper to remark, however, that it very often fails, and is generally, perhaps, an agency on which but little reliance can be placed.

When the disease attacks those of shattered constitutions, or old individuals, whose powers are enfeebled, great caution is needed in the management. It may not be advisable to abstract blood, either generally or locally, by means of leeches: slight punctures will, however, afford relief. There are some, indeed, who do not approve of active antiphlogistic treatment in any form of erysipelas, and who prefer the administration of tonics even from the very beginning. (*Robt. Williams*.) In all cases, we must be careful not to over-stimulate by our internal agents, and to bear in mind that by our stimulants we can only act upon the excitability already in the system, and may exhaust it by their injudicious use. Often, we trust altogether to the recuperative powers. In other cases, we think it advisable to administer tonics—as the vegetable bitters, the sulphate of quinia; and allow wine whey, beef tea, &c. The more diffusible excitants are rarely, if ever, of greater efficacy than the permanent tonics just mentioned. Especially is this tonic management necessary, when the inflamed part exhibits a tendency to gangrene. The ordinary topical remedies, which are used by the surgeon in gangrene—charcoal poultices, and solutions of the chlorides of lime and soda—not of the chlorides of

calcium and sodium, as recommended by a recent writer, (*Schedel*), then become necessary.

Throughout the whole disease, opium and its various preparations may be freely allowed, with the view of allaying pain. In such cases, it must be given in full or sedative doses.

Induration of the Cellular Tissue.

SYNON. Induratio telæ cellulosaë neonatorum; Scleremia, Compact œdema of the cellular tissue, Skinbound disease; *Fr.* Endurcissement du tissu cellulaire, Œdème du tissu cellulaire des nouveau-nés, Asphyxia lente des enfans nouveau-nés; *Ger.* Zellgewebsverhärtung der Neugeborenen.

This disease has been often observed in the French hospitals, and is said to have been so fatal, that in the years between 1808 and 1811, there died, in the Hôpital des Enfants trouvés, 576 out of 643 who were attacked. A recent writer, however, (*Billard*), believes it to be incorrect to refer the mortality to this affection. "There often exist, at the same time, affections of the brain, lungs and intestinal canal, much more serious than œdema, and much more fatal to children." (*Billard*, *G. Stewart*, of New York.)

The difference amongst pathologists as to the precise character of the disease renders it difficult to know where to place it. By one, it has been supposed, that as hepatization of the lung has often been seen along with it, pneumonia is the principal malady, (*Trochon*;) another considers it an entero-cellular phlegmasia, (*Denis*;) and another is of opinion that it is an erysipelas approximating to the phlegmonous character. (*Broussais*.) Under these conflicting views, it may not be inappropriate to consider it here.

Diagnosis.—Two varieties of induration of the cellular tissue are admitted;—the one serous or œdematous, the other concrete or adipous.

The *œdematous form* appears to attack the foetus as well as the new-born. It consists of a hard, resisting, cold, pale or livid tumefaction of the extremities or cheeks,—the consistence varying according as the induration is slight or considerable. The tumefaction is soft and doughy, but differs from œdema in not preserving the impression of the finger; and from emphysema in not being elastic or crepitant. The temperature is always below the natural, and the more so when the tumor is recent and considerable; when, however, the affected parts are warmed, they soon resume their ordinary temperature. The colour of the skin becomes purple or livid; the perspiration is suspended, so that there is a remarkable dryness of the cutaneous surface; and certain muscles are permanently contracted, whilst others are greatly relaxed.

Along with these local symptoms, the pulse is small, contracted, and slower than natural; the tongue is white or slightly red at the edges; and vomiting, diarrhœa or constipation may be concomitants. Later on, deglutition becomes difficult, and the respiration laborious. The child is restless, and there is something peculiar about the cry, which is weak and obscure.

In proportion as the induration extends to other parts of the

body, the general phenomena become more alarming; the child falls into a comatose condition; deglutition is almost impracticable; and death takes place from the first to the twentieth day. Occasionally, the disease terminates by resolution, when the affected parts gradually resume their suppleness and normal temperature.

In the *concrete form*, the indurated parts have the firmness of suet; the skin, which is of a yellowish white hue, has the appearance of wax, and is bound down to the muscles; and the limbs appear to be studded with hard, irregular tumours. In the last stage, they seem as if they had been frozen, and their consistence is so great, that percussion is sonorous; they feel cold to the touch, and motion is impracticable. It would appear, however, that in this variety, there are fewer nervous symptoms, and that digestion, circulation and respiration are less affected than in the serous variety. (*Rostan.*)

Pathological characters.—The areolæ of the cellular tissue are said to be distended, in the first variety, by a greater or less quantity of a very albuminous serous fluid, which is transparent, colourless, or slightly tinged yellow or red: sometimes it is semi-concrete. (*Rostan.*) It is stated, however, that there is not a greater degree of coagulability than in the fluid of the œdema of adults. (*Carswell.*) In the second variety, the adipous tissue appears to be surcharged with a sebaceous, opaque, thick, compact, yellowish matter, which is richer in stearine than ordinary fat.

Morbid appearances are met with in the brain, lungs and digestive organs,—a circumstance which has given occasion to various opinions in regard to the primary seat of the disease. It has not been settled, however, whether these appearances were effects or causes, or simple concomitants. (*Rostan.*) A recent writer (*Billard*) considers the disease to be nothing more than simple œdema, analogous to that which occurs in adults, and old people, affected with diseases of the lungs, heart and large vessels.

Causes.—These are wholly unknown. It is probable, however, that the disease may be dependent upon the same causes as give rise, at times, to dropsy in the adult;—impediments to the functions of circulation and respiration. (*Baron, Valleix.*)

Treatment.—The great accumulation of blood found, in certain cases, in the internal organs, suggested the employment of leeches to the chest, and even of general blood-letting (*Palletta, Billard*), which ought, however, to be practised with caution: the child should, moreover, be cased in flannel, and frictions may be made over the body, and especially over the affected parts. If these agents are insufficient to remove the disease, it will probably terminate fatally. The employment of emetics has been suggested with the view of removing mucus and exciting respiration, with the internal use of stimulants, as wine-whey. (*Maunsell.*) For subjects so tender, it is difficult to lay down any fixed plan of treatment. Much will have to depend upon the judgment of the practitioner in the individual case.

II. VESICULAR ERUPTIVE FEVERS.

1. MILIARIA.

SYNONYM. Emphlysis miliaria, Miliaris, Febris miliaris, Exanthema miliaria, Synochus miliaria, Purpura (of some), P. miliaris, Miliaria sudans, Miliaris sudatoria, Sudamina, Purpura alba, P. rubra, Papula sudoris, Miliary fever, Millet seed rash; *Fr.* Miliare, Millot, Millet, Pourpre blanc; *Ger.* Frieseln. Frieselfieber, Frieselexanthem.

The sudamina, which appear in various diseases, have, by some pathologists (*Andral*), been separated from miliaria, but they are usually congenerous affections, and neither the one nor the other requires any long investigation.

Sudamina are small prominent vesicles, about the size of millet-seed,—whence the name miliaria,—which are of a round shape, transparent, and contain a thin, watery humour, possessed of no viscidty. Under the separate diseases, it has been remarked, that they present themselves in the course of many affections, and especially such as are accompanied by sweating,—whence the name sudamina.

In typhoid fever, the eruption is regarded by some as one of the pathognomonic signs.

It usually appears upon parts of the body where the skin is fine and delicate—as upon the anterior part of the chest and abdomen, on the neck, groins, armpits and umbilicus, and, occasionally, over almost the whole of the body.

The duration of the eruption is not usually long; occasionally, not more than a few hours; at times, however, it continues for days, the fluid becomes gradually absorbed, and no trace remains of the previous existence of the eruption.

In the wards of the Hospital La Pitié, under the care of a distinguished physician (*Bovillaud*), the subject of sudamina has attracted much attention, giving rise to the deductions, referred to under another head;—*first*, that they are intimately connected with the actual or antecedent existence of prolonged sweats, without distinction of diseases, so that we may almost always conclude as to the presence of the one from that of the other; *secondly*, that they are in constant relation with the sweats,—numerous when these have been copious, and scarce under opposite circumstances; and *thirdly*, that the same relations exist in the different regions of the body,—that is, they are abundant in the parts where the sweats accumulate; and conversely. (*Henroz.*)

In regard to the miliary fever, which was at one time so common in the sporadic form, it has now almost disappeared, since the heating regimen has been mainly abandoned. The works of the older writers show, that it was the custom to load puerperal women with bed-clothes, and to administer heating articles to them. Miliary fever was then so common as to be considered a disease of the childbed state; but now we rarely or never see it. (*Willan.*) The epidemic form, however, which occasionally prevails in France, and has been termed *La Svette Miliare*, *La Svette de*

Picardie would appear to present itself in spite of the use of the antiphlogistic method of treatment. (*Rayer.*) One of these epidemics occurred in 1837. (*Pratbernon.*)

The eruption of miliary fever is essentially the same as the sudamina; they may, indeed, be esteemed identical: the affection is always perhaps symptomatic, when it occurs sporadically, and does not merit much attention. It has, indeed, been denied, that any such disease exists. (*Chomel.*)

Examples of an entirely local variety of this eruption are seen at times, after friction with certain ointments, or the application of a cataplasm of linseed meal slightly rancid. (*Andral.*)

The kind of sweating sickness, accompanied by a miliary eruption, termed *La Suette de Picardie*, has prevailed in different departments of France, and was accurately observed by a distinguished writer on diseases of the skin. (*Rayer.*) It recurred in 1821, and was described at length by M. Rayer, in a work, which he did the author the honour to transmit to him. M. Rayer considers the disease to consist of a simultaneous inflammation of various tissues, and proposes to class it with variola, rubeola, and scarlatina. It occurred under two forms,—the mild and malignant,—the latter proving fatal, in many cases, by the supervention of encephalic mischief.

Treatment.—In an ordinary case of miliaria, as well as in the epidemic form, the management must be conducted according to general principles. In the simple variety, the antiphlogistic treatment and regimen are alone necessary. In the epidemic variety, the treatment must repose on general principles.

2. CHICKEN-POX.

SYNON. Varicella, Pseudo-variola, Variola spuria, V. volatica, V. nothæ, V. illegitimæ, V. pusillæ, Emphlysis varicella, Exanthema varicella, Synochus varicella, Chicken-pox; *Fr.* Varicelle, Petite vérole volante, Vérolette; *Ger.* Varicellen, Falschen unechten Pocken.

This disease obtained its name from the notion, that it is a variety of smallpox; and, of late years, owing to the existence of vesicular eruptions, having a perfect resemblance to varicella, and occurring during the prevalence of epidemic smallpox, the identity of the two diseases has been maintained. (*Thomson.*) This was, however, an accidental coincidence, and few now doubt, that the characteristics of the two affections are strikingly different, both in the fact of their progress, phenomena, and capability of being communicated by infection. In extensive epidemics, it not unfrequently happens, that three groups of eruptions prevail simultaneously,—smallpox, modified smallpox or varioloid, and a vesicular eruption having all the characters of varicella. (*Schedel.*)

Diagnosis.—The chief characters of varicella are, that it is a noncontagious disease, characterized by a more or less copious vesicular eruption, generally preceded and accompanied by febrile

symptoms,—desiccation beginning from the fifth to the eighth day. There is not generally much difficulty in discriminating between chicken-pox and smallpox; but it is not always so easy to distinguish it from modified smallpox. The eruption of the latter, as will be shown hereafter, is pustular; the pustules being small, circular, and commonly depressed in the centre. In chicken-pox, the vesicles are at first transparent; but the fluid subsequently becomes of a sero-purulent character. The vesicles are never succeeded by the little tubercles, which are left after modified smallpox. They differ, too, in the circumstance of chicken-pox not being capable of being communicated by inoculation, whilst the matter of modified smallpox, inserted under the cuticle of one who has neither been inoculated nor vaccinated, produces genuine smallpox.

The generality of writers make two forms of chicken-pox, differing from each other in the size of the vesicles—the varicella with small vesicles, and the varicella with large. Some admit three divisions according to the shape of the vesicles; 1. the *Varicella lentiformis*, in which the vesicles are irregularly circular; flattened at the top; the fluid being liquid at the first, whitish and straw-coloured afterwards. This is the *lenticular chicken-pox*, (*Willan*,) or *common chicken-pox*. 2. The *Varicella coniformis*; in which the vesicles are acuminate, and the fluid pellucid throughout, constituting the *Conoidal chicken-pox*, *Swine-pox*, *Water-pox*, or *Water-jags* of many; and 3, the *Varicella globularis*, in which the vesicles are globular and larger; the fluid at first whey-coloured, afterwards yellowish,—the *Hives*.

These varieties are, however, sometimes associated, and the fluid in some of them approaches occasionally the purulent character, so as to lead to the disease being mistaken for smallpox, or for modified smallpox.

Chicken-pox—as before remarked—is usually preceded by more or less constitutional disturbance; and, at times, the fever is considerable. The stomach is usually disordered, and, occasionally, the pharyngeal mucous membrane, and that of the air-passages is more or less inflamed. Commonly, the eruption commences on the second or third day, or even later, and continues to break out in fresh places for several successive days;—the febrile symptoms not generally subsiding until it has been out for some days.

Treatment.—This is ordinarily very simple. In many cases, the indisposition is so slight, that the patient goes abroad as usual. In no case scarcely is it necessary to do more than inculcate quiet, especially in bed, and the antiphlogistic regimen, which may be aided by occasional mild cathartics.

III. BULLAR ERUPTIVE FEVERS.

I. PEMPHIGUS.

SYNON. Emphlysis pemphigus, Febris bullosa, Morbus bullosus, Febris pemphigodes, Morta, Febris vesicularis, F. ampullosa, Pompholyx, Phlyctæna, Bulla, Hydatis, Vesicular fever, Bladdery fever; Ger. Blasenanschlag.

The concurrent testimony of pathologists is in favour of the two diseases—as they were formerly considered to be—Pemphigus and Pompholyx, being one and the same. Both terms are used to signify an affection characterized by an eruption of blebs or bullæ in different regions of the body. *Pemphigus* was generally employed to designate it when the blebs were preceded or accompanied by fever;—*Pompholyx*, when there was no fever, and the eruption had no inflammatory base.

The bullæ are generally isolated, and of variable size; but commonly large, as much as two inches or more in circumference. The fluid, which is at first limpid, becomes gradually reddish, and, ultimately, the bullæ break, and the formation of thin incrustations succeeds.

Pemphigus may present itself in two forms—the *acute* and the *chronic*.

The acute form of the disease is met with but rarely (*Bielt, Rayer*;) some, indeed, have doubted its existence. (*Willan, Bateman*.) A recent writer (*Schedel*) affirms, that he has seen several very distinct and severe cases. The premonitory symptoms of acute pemphigus may be simply,—general indisposition with loss of appetite. Sooner or later, roundish red spots or patches appear on which are blebs, either occupying the whole or a part of the spot. The size of the blebs is various,—from that of a pea to that of a walnut, and even of a much larger body, and several of them may form in groups, so as to occupy an extensive space. Under such circumstances, the epidermis separates over a large extent, and exhibits the skin so much altered in its organization, that it appears to have been burnt.

At their height, the blebs are distended by a transparent serous fluid; but after they begin to shrivel, the fluid becomes turbid. Most of them burst within the first twenty-four hours, but some do not for several days.

The general symptoms may be slight or very serious; but there appears to be no constant ratio between the extent of the eruption, and the intensity of the morbid derangement.

A remarkable variety of acute pemphigus is characterized by the appearance of no more than a single bleb at a time, which is commonly of a large size. This is the *Pompholyx solitarius*. The disease does not usually terminate, however, with the formation of one bleb. Within a day or two after the first has disappeared, a second breaks out in some part near it, and this is frequently followed by a third and a fourth, all of which pursue a similar course.

Chronic pemphigus—*Pompholyx diutinus*—appears to be a more common form than the acute. It may be either general or partial, and is characterized by a constant succession of bullæ for weeks, so that commonly they are in all stages,—some appearing, and others shrivelling up. Thin, scaly incrustations form over the excoriated parts; and the cutaneous surfaces, which have been the seat of the eruption, are covered with irregular blotches of various sizes. In some cases, the succession of eruptions has been protracted for months and even years.

Pemphigus would seem to be conjoined, occasionally, with various other cutaneous diseases, especially with herpetic eruptions and prurigo. Its complication with the last has been described as a distinct species under the name *Pemphigus pruriginosus*, the most remarkable and distinguishing symptom being the intense itching that accompanies the eruption.

Causes.—The causes of pemphigus are generally extremely obscure. The acute form appears to attack all ages, and has often been seen in the newborn. (*Schurig, Göckel, Düttel, Ledelius, Germanus, Jörg, F. B. Osiander, Wichmann.*)

The chronic form would appear to be uncommon in infancy, and to attack elderly people more especially. Some difference of opinion exists as to the greater liability of one sex than another. Whilst one affirms it to be more rarely seen in females, (*Schedel*), another (*Andral*) asserts, that females are more subject to it than males. This is, however, a discrepancy of no moment.

The disease occurs in those of debilitated habits, who have been ill fed, and have dwelt in damp situations. Such, at least, is the general opinion, but—as already remarked—the etiology of the disease is sufficiently obscure.

Treatment.—The acute form of pemphigus commonly requires nothing more than quiet and the antiphlogistic management; and the same treatment is demanded in the chronic form at the commencement. Afterwards, the mineral acids may be conjoined with the use of tepid and alkaline baths; and sleeplessness and irritation may be removed by sedative doses of opium or of its preparations. In all cases, it is important to inquire into the state of the system, and if the disease appears to be kept up by defective nutrition, or by residence in a damp insalubrious locality, the patient must be put upon a better diet, with the use of vegetable and mineral tonics, and remove to a more healthy situation. In long protracted cases, the arsenical and other preparations, directed under chronic Eczema, may be of marked advantage.

But little local treatment is needed except the baths above directed; emollient applications may prove soothing, after the formation of incrustations; and it has been advised,—should there be considerable local irritation and pain,—that a small puncture should be made with a lancet, and perhaps a light poultice of linseed meal be applied, (*Mackintosh*;) but it can rarely be necessary to interfere with them; perhaps, indeed, it would be always best to leave them to themselves.

IV. PUSTULAR ERUPTIVE FEVERS.

1. SMALLPOX.

SYNON. Variola, Variolæ, V. veræ, Euphlogiæ, Æolecthyma, Empyesis variola, Pestis variolosa, Febris variolosa; *Fr.* Variole, Petite vérole; *Ger.* Echten Blattern, natürliche Blattern, Menschenpocken, Menschenblatternkrankheit.

Smallpox—like measles—is an eruptive fever, propagated by contagion, running a definite course, and, as a general rule,—to which, indeed, the exceptions are extremely rare,—affecting persons but once in the course of life. Its origin is lost in antiquity, and the common opinion is, that, in these days, it never arises except by contagion; yet there is reason to believe, that under an exceedingly unfrequent catenation of causes, it may be engendered. It must have originated in the first instance from common causes, and it would be strange, if the circumstances that gave rise to it then can never now recur.

Long dissertations have been written on this disease, which, for so many ages, was the scourge of communities; and which, where it did not prove fatal, left the most unpleasant traces behind it, disfiguring the face of beauty, so that the former traits could be scarcely, if at all, distinguished; but it has become of somewhat less interest since the introduction of inoculation, and *à fortiori* of vaccination; and few opportunities occur for witnessing it in country practice.

The most convenient division of smallpox is into the *distinct*, the *confluent*, and the *modified*. Other divisions have been made by writers, (*Geo. Gregory*;) but they are not necessary, and are apt to create embarrassment.

1. *Distinct Smallpox, Variola discreta, Variola discreta benigna, Empyesis variola discreta, Variolæ regulares discretæ.*—Before describing the symptoms of distinct smallpox, it may be remarked, that in all the forms and varieties, four stages may be distinguished:—*first*, that of incubation; *secondly*, that of the eruptive fever—the *stadium infectionis, irritationis, opportunitatis, ebullitionis* of some, (*Most*;) *thirdly*, that of maturation—the *stadium maturationis et suppurationis*, (*Most*;) and *fourthly*, that of decline, desiccation and secondary fever,—the *stadium exsiccationis seu desquamationis* of some. (*Most*.)

The *stage of incubation* is the period between the reception of the poison into the system, and the commencement of the visible signs of the disease. It is the latent period, and does not differ from that of the other eruptive fevers, which are produced by a specific contagion. Soon after the reception of the miasm, there may be very little indisposition; but, for some days before the eruptive fever, the prodromic or premonitory signs become, at times, marked, and the patient is languid and listless, with more or less disorder occasionally in the digestive functions.

The duration of the period of incubation, where the disease is taken “naturally,” varies: the usual time is twelve days, but it may extend from seven to fourteen. (*Geo. Gregory*.)

Usually, on the eleventh or twelfth day from the reception of the poison into the system, the *eruptive fever* declares itself, and, almost always, by rigors, followed by the train of symptoms which usher in measles, and which do not, therefore, require repetition here. It may be remarked, however, that the signs of great prostration of strength are decided; that the expression of the countenance is anxious; and that in cases where the constitution is delicate, the debility amounts almost to collapse. The period at which the eruption appears is tolerably fixed. Almost always, it is seen at the end of forty-eight hours from the commencement of the eruptive fever, whatever may be the character of the disease,—that is, whether distinct or confluent. This period may be lengthened by weakness of habit, loss of blood, long continued vomiting, or extreme cold; but so far as the experience of one who has had large opportunities for observation goes, (*Geo. Gregory*), it is never shortened.

The eruption is generally completed over the whole body in one or two days, but it may extend through double this period. Minute pimples, sensibly elevated above the skin, first show themselves on the face and forehead, the nose, the chin and the upper lip: afterwards, they are seen on the neck and wrists; and, subsequently, on the trunk and limbs—the feet being almost always implicated last.

In cases of distinct smallpox, the fever is greatly relieved on the appearance of the eruption.

When the eruption first appears, the pimples are separated, and surrounded at their base by a red areola; and, when they are numerous, it is difficult to decide whether the disease be smallpox or measles. The difficulty does not continue long, however, for the pustules become more and more elevated, and the true character of the disease is manifest.

The *stage of maturation* of the pustules succeeds to that of the eruptive fever. On the first and second days, the eruption is papular; but, about the third day, the tops become vesicular and transparent; and, on the same or the next day, the pustular character is marked, and suppuration has commenced. The pustules have now acquired some size, and their tops present a flatness, followed by an umbilicated depression. This is perceptible from the third or fourth day, and becomes more marked as the period of maturation approaches. The pustules present a whitish appearance, and are surrounded by a red areola. The umbilicated depressions are readily seen on isolated pustules, but when they coalesce, or are in groups, they are rarely perceptible. On the eighth day from the appearance of the eruption, the suppuration is at its height; but as the pustules on different parts of the body did not appear simultaneously, three or four days may elapse before some of them attain maturity. Those on the face and neck generally acquire their full size first, and discharge their contents; next, those on the trunk and upper extremities, and, lastly, those on the feet.

Simultaneously with the appearance of the pustules on the skin,

they may be observed on the mucous membrane of the lips, on the tongue, palate, interior of the cheeks, &c.; but it has been questioned whether they are ever seen lower down, (*Andral*,) although it has been affirmed, that dissections have exhibited them throughout the whole tract of the intestines. (*Rostan*.) They are not unfrequently seen on the eye, and the author has met with more than one case, in which loss of sight was occasioned by them; but of the variolous inflammation of the eye, he has treated elsewhere.

The seat of the variolous pustule is the cutis vera. Beneath the epidermis, a disc of a consistence like pulp or thick mucus, a pseudo-membranous secretion, exists; and the vesicle containing it is found to be multilocular.

The constitutional symptoms, during the stage of maturation, vary greatly in intensity, and this usually in a direct ratio with the number of the pustules: when they are very numerous, the fever may be high, and the local irritation considerable. Frequently, there is great tenderness of surface, and itching; the face is often swelled, and the eyes closed by the tumefaction of the eyelids immediately before the entire maturation of the pustules, and the swelling of the hands is often a source of great inconvenience. Ptyalism, also, occurs, at times, to a considerable extent; this has been regarded as salutary, (*Sydenham*;) but it is considered by others, (*Andral*,) to be an inflammatory process, occasioned by the existence of the pustules, and may, according to M. Andral, be attended with disagreeable consequences. Such a case the author has not met with.

On the eighth day from the appearance of the eruption, it begins to dry up, after the bursting of the pustules, and scabs form, which, under favourable circumstances, fall off in the course of four or five days. This is the *stage of desiccation* or *decline*. By the fourteenth day of the eruption, the fever has generally subsided; the swelling of the face has diminished or disappeared, and the incrustations have fallen off from the face and upper parts of the body; but the surface of the skin, especially of that of the face, is left of a reddish brown colour, and, where ulceration has occurred, it may be pitted. The discoloration sometimes continues for months, and the pits remain for life.

This is the ordinary course of the distinct form of smallpox.

2. *Confluent smallpox, Variola confluens, Empyesis variola confluens, Variolæ regulares confluentes*.—In this variety of smallpox all the precursory symptoms are more severe, the eruptive fever runs much higher; the regular progress of inflammation is interfered with, by the immense quantity of papulæ, which occupy the skin, and the inflammation extends to the subjacent cellular texture; the mucous surfaces of the mouth, pharynx, larynx and trachea are, also, the seats of the eruption, and it has been seen in the mucous membrane of the rectum, (*Mackintosh*;) the nervous system is greatly implicated; the fever continues, and even increases in violence after the appearance of the eruption, and its

decline is attended with secondary fever, which appears to be the fever of recuperation, and occurs chiefly in cases where the cellular membrane over the body has become extensively involved with the skin in the inflammation.

This form of the disease is characterized by hot and dry skin; white tongue; rapid pulse; sleeplessness, and unquenchable thirst; and is very apt to be complicated with some important affection of a part of the economy,—as exanthematous, pustulous, and other affections of the skin; superficial abscesses; ophthalmia; encephalic, thoracic or abdominal mischief, &c. &c. Like measles and scarlatina, it is also liable to develope scrophulous and other taints, so that its sequelæ are, at times, most distressing. Throughout the whole period of maturation and desiccation, there is a disagreeable odour from the body, which is quite characteristic.

Although in many cases the inflammation and irritation of the skin are so violent as to induce great febrile irritation; at other times, owing most commonly, perhaps, to deficient power in the system, the eruption is imperfectly developed, and instead of filling, and proceeding favourably to maturation, the pustules remain flat, and contain but very little fluid. The accompanying fever is, in many of these cases, markedly adynamic; and certain of them put on all the characters of congestive fever. (*Mackintosh.*) The strikingly adynamic character of the fever, and the appearance of the skin, resemble so much petechial typhus, as to render the term *petechial smallpox*, which has been given to this form of the disease, not inappropriate. The pustules themselves fill, at times, with a bloody ichor, so as to give occasion to the term *Variolæ nigræ* sometimes applied to it. The appearance of the pustules has, indeed, suggested numerous subdivisions of variola by different authors, but they do not seem to be of any practical utility, whilst they cannot fail to embarrass the young inquirer.

It is generally sufficiently easy to diagnosticate smallpox, except during the first day of the eruption, when it may resemble measles or febrile lichen; a short time, however, is sufficient to remove the uncertainty; and, prior to this, the existence of smallpox may be suspected, from the fact of the person having been exposed to contagion, and his having had measles previously.

The danger of the disease depends greatly on the extent of the eruption, and the implication of the mucous membranes. Distinct smallpox very rarely proves fatal; whilst confluent smallpox is full of danger, and proves fatal, at times, by the supervention of internal mischief, when everything has seemed to be going on favourably. When the mucous membranes, and especially that of the larynx, are much affected, the danger is great; hence, hoarseness, at an early period, is always unfavourable. The appearance of the mouth and throat will afford some index as to the probable state of the larynx and trachea. A natural tone of voice is a good omen, even although the eruption be confluent, with a disposition to cellular inflammation. (*Geo. Gregory.*)

It need scarcely be said, that where symptoms of typhous prostration exist, with an altered and putrescent condition of the fluids, the prognosis must be unfavourable.

Smallpox is more dangerous to very young and to old persons. It has been affirmed, indeed, from the results of observation, that persons above forty years of age rarely recover even from semi-confluent smallpox. The most favourable age would appear to be from the seventh to the fourteenth year, when the powers of life are in full vigour, without the risk of plethora. (*Geo. Gregory.*) Plethora is, indeed, as unfavourable as great constitutional debility.

In very severe cases, the fatal event takes place before the eighth day; but more commonly it occurs between the tenth and seventeenth days. Prior to the introduction of vaccination, the deaths by smallpox were to the total deaths in town and country in the ratio of 16 to 100, or about one-sixth of those attacked, (*Geo. Gregory:*) the average mortality is usually stated at 1 in 4; but the numerical method has not been extensively and rigorously applied here. It seems to vary in different places; thus, the mortality from primary smallpox in London, has been estimated at 36 per cent; (*Geo. Gregory;*) whilst in Germany it is only 20 per cent. (*Heim.*)

Even now, it would appear—when accurate statistical accounts are taken by the Registrar-General of England—that in 1837, there were only five diseases more fatal in England, and that the deaths throughout England and Wales, amount to about 12,000 annually.

The following tables, taken from the records of the Smallpox Hospital, London, exhibit the comparative mortality in the varieties of regular smallpox, at different ages, during the epidemic, in 1838. They farther show the degree of protection, and the diminished mortality after vaccination. (*Geo. Gregory.*)

NORMAL SMALLPOX.	UNPROTECTED.		VACCINATED.	
	Admitted.	Died.	Admitted.	Died.
Confluent,	295	149	56	21
Semi-confluent,	78	8	42	4
Distinct,	19	0	20	0
Total,	392	157*	118	25

AGES.	UNVACCINATED.		VACCINATED.	
	Admitted.	Died.	Admitted.	Died.
Under five years of age,	42	20	0	0
From 5 to 9 inclusive,	37	11	5	0
“ 10 to 14 “	30	8	25	0
“ 15 to 19 “	104	32	90	6
“ 20 to 24 “	115	50	106	16
“ 25 to 30 “	45	23	55	8
“ 31 to 35 “	12	7	13	1
Above 35 years of age,	11	6	4	0
Total,	396	157	298	31

* Of these there died of fever and superadded erysipelas, 14.

At times, during particular epidemic influences, the mortality from smallpox is terrific. A modern writer (*Mackintosh*) affirms, that he had occasion to attend fifty cases of smallpox, all of which were distinctly traced to the imprudence of a woman, who exposed her unvaccinated child to the contagion when visiting a sick friend. Of these fifty patients, thirty-five had gone through the process of vaccination; fifteen had never been vaccinated—they were infants under one year of age. All the protected cases recovered. Of the fifteen unprotected, ten died, and three only of the fifteen had the disease slightly. Of the five children that survived the attack, one did not recover perfectly, and died of chronic bronchitis some months afterwards.

Causes.—It has been already remarked, that the mode of propagation of smallpox is by contagion. The sporadic origin, if it ever occurs, must unquestionably be rare. The disease may be communicated to one who is unprotected—that is, who has never had it in the natural way, or by inoculation, or who has not been vaccinated. It may be induced by a miasm diffused in the air, or by positive contact of the variolous matter; or by inserting it under the cutis—in other words by *inoculation*. It has been affirmed, that the contagious character is developed during the suppuration of the pustules, and is preserved until their desiccation, (*Heberden, Haygarth, Andral,*) and that the disease is not communicable during the eruptive fever, and the two or three succeeding days; but experience appears to have shown the inaccuracy of this opinion, and that there is no safety after the manifest appearance of the disease.

The scabs retain the contagious power for a considerable time; and it is affirmed, that a case of confluent smallpox will taint the air, and spread the disease for at least ten or twelve days after death. (*Geo. Gregory, Hawkins.*)

The contagious miasms can attach themselves to clothing; and if air be excluded from these fomites, they may communicate the disease for a long period afterwards. Such is the view entertained, and it is probable. There can be no doubt, however, that a free ventilation will prevent this; for the author has never met with a case, in which the practitioner has been the agent of conveying the disease from one house to another.

The circumstances that give occasion to an attack of confluent smallpox in one person, and of the distinct kind in another, from exposure to the same contagion, are totally unknown. Certain it is, that the same matter will produce both forms in different individuals; nor would it seem, that the matter of the confluent pustule is more likely to induce the confluent form than that obtained from the distinct pustule. The form of the disease appears to depend upon constitutional differences, that are inappreciable.

Like other contagious diseases, this is epidemico-contagious. In other words, it does not rage at all times alike. Before inoculation or vaccination was introduced, it visited epidemically the same

region after uncertain periods; and one of the strong objections, urged against inoculation, was the fact, that as natural smallpox could be communicated from the inoculated, the introduction of inoculation kept the disease always in a community, and that hence the mortality from smallpox was absolutely increased after the introduction of inoculation, although the ratio of deaths in those attacked was diminished.

The greatest epidemics in recent times, in England, have been in 1781, 1796, 1825 and 1838. (*Geo. Gregory.*)

Season and climate are devoid of influence over it.

Smallpox attacks both sexes, and all ages; and, like measles, it may affect the fœtus in utero. The cases of this kind on record are very numerous. (*Düttel, Fabricius Hildanus, T. Bartholin, Fernelius, Hoogeveen, Van der Wiel, Van Swieten, Mead, Rosenstein, Ploucquet, Jenner, Mauriceau, Hunter, Billard, &c. &c.*) In many of them the mother was unaffected.

All persons are not equally susceptible; and the susceptibility appears to vary at different periods. A physician may, for example, pass through a long life attending to many cases of it with impunity, and yet may, ultimately, take the disease naturally or by inoculation. It rarely affects the same person more than once; so rarely, that the proportion has been estimated at not more than 1 in 50,000; but this—it need scarcely be said—is not founded on any accurate computation. When it does occur a second time, it is generally after a long interval.

Where the system is protected, local inconvenience sometimes arises from the application of the smallpox matter or miasm, but the disease does not develop itself.

Pathological characters.—The appearances of greatest moment observed on dissection are in the air passages. Pustules have been seen as low down as the bifurcation of the bronchia; with unequivocal evidences of high vascular excitement in the mucous membrane generally. It appears engorged with blood, and covered with a copious viscid, purulent or puriform secretion, of a gray or brownish colour; and, on detaching this, the membrane itself seems thick and pulpy, and, in the worst cases, black or sloughy. In an early stage of the disease, the epithelium exhibits a number of dim spots of a round form and of the size of lentils, produced by the exudation of a fluid between it and the layer of the mucous membrane beneath. In the further progress of the disease, the effusion becomes more copious and raises the epithelium, which may then be stripped off, exposing the inflamed and sometimes ulcerated derma. (*Petzholdt, G. Gregory.*)

Generally, evidences of pleuritic inflammation, followed by effusion, are found on one side,—rarely on both sides.

Where convulsions or coma have preceded death, there may be morbid appearances in the encephalon or its meninges, as in other diseases attended with these phenomena.

In the œsophagus, minute elevations, which have been regarded

as pocks, have been found on those who have died before the 12th or 13th day. (*Mackintosh.*) Small, round, ulcerated spots have, likewise, been found in the mucous membrane of the intestines, which by some have been regarded as variolous pustules,—by others, as ulcerated follicles, similar to what are found in typhoid fever. These appearances are, however, rare, and the freedom of the abdominal viscera from urgent symptoms during life, and from all trace of disorganization after death, is stated as a remarkable feature in the disease. (*Geo. Gregory.*)

It would appear to be necessary, that there should be contact of air or light with the mucous membrane, in order that pustules may be developed; hence, if the rectum be prolapsed during the stage of maturation, pustules may be witnessed upon it. (*Mackintosh.*)

Treatment.—In the distinct form of smallpox, not much treatment is generally needed. It is sufficient to adopt the antiphlogistic regimen; to have the chamber well ventilated, and to administer, once or twice a week, a cathartic. Whilst the surface of the body is in such a state of erethism, the mucous membranes can scarcely fail to participate in some measure; and, therefore, a cathartic may prove serviceable by removing morbid secretions.

In every form of smallpox, it must be borne in mind, that the disease has a tendency to run a definite course, so that if all goes on favourably, the danger will be over in the course of a certain period; but it must be equally borne in mind, that the extent of the eruption may give rise to intense phlegmasia of the skin, and to high arterial excitement; that, in other cases, the powers may be oppressed or depressed; and that, in others again, some important internal organ may be attacked with active hyperæmia, and an unfortunate termination be the consequence.

At one time, in this as in other fevers, it was believed, that heat was necessary for the due maturation or concoction of the pustules, and hence the heating regimen and the excitant medication were carried to an extent, that added fearfully to the mortality. "The object of the physician in modern times"—as a recent writer has well remarked, "has less of pomp, but more of true philosophy about it. He is content if he can keep within due bounds the action on the surface; if he can check the congestions and inflammations, which occasionally supervene in internal parts; and lastly, if he can support the system under protracted fever, and the exhaustion consequent on extensive pustulation." (*Geo. Gregory.*)

In the initiatory or eruptive fever, the treatment has to be essentially the same as in the same stage of measles, or as in any inflammatory attack of fever. Cathartics, cold drinks, the free admission of cool air; and, if the arterial excitement be high, or there be signs of engorgement of some internal organ—as indicated by intense headache and perhaps delirium; oppressed breathing; great irritability of the stomach, with pain upon pressure; which last symptom has been regarded, by some, to be a characteristic of

smallpox—blood may be taken from the arm; or should this not be considered advisable, leeches may be applied to the temples, if the encephalon be mainly affected;—to the chest, if the air passages; and to the abdomen, if the abdominal viscera be seriously implicated.

The stage of maturation is a necessary part of the disease, but many agencies may be adopted in the way of palliation. Should the pustules not fill in a satisfactory manner, the cause must be investigated; and if it appears to be owing to a concentration of vital activity towards some internal organ; even should the pulse be small, it may be advisable to adopt the course deemed appropriate in congestive fever,—that is to take away a small quantity of blood from the arm, or by means of leeches; to apply bottles filled with hot water; and a bladder half filled with the same to the epigastrium, and to administer with great caution, should it appear to be needed, wine whey.

When there is much pain in the throat, and difficulty of swallowing, a few leeches may be applied, and afterwards a warm emollient poultice. Throughout this stage, it may be advisable to administer cooling, but not irritating, cathartics,—as senna and salts,¹ castor oil, &c., with the effervescing draught and the ordinary refrigerant drinks, recommended in fever. Great attention must likewise be paid to the supervention of visceral inflammation, and to meet it by appropriate depleting and revellent agencies.

¹ R.—Infus. sennæ, ℥ij.

Magnes. sulphat. ℥ij.—M.

Dose, one half to be repeated if necessary.

Where the symptoms are associated with a putrescent condition of the fluids, and the ordinary signs of petechial fever, the treatment must be that advised under typhus. It is, indeed, impossible to point out all the modifications of management, that may be demanded according to the precise complication. A knowledge of general principles will, however, suggest the appropriate remedies.

It is an ancient recommendation to puncture the pustules, so as to let out the contained humour, and prevent—it is conceived—the absorption of the pus; but it has not been found advantageous: more recently, it has been advised to cauterize the pustules within the first two or three days, or even somewhat later, with the view of abridging their duration, and preventing pitting. The best mode of applying the caustic is to cut it to a fine point, and pierce the centre of each pustule with it. (*Velpéau*.) Mercurial plasters, composed of calomel or corrosive sublimate, are said to have the power, when applied to the skin, of so modifying its condition as to prevent the maturation of the pustules; and wetting the face frequently with the spirits of hartshorn is said to have kept down the inflammation, and prevented the pustules from becoming either large or irritable. (*Professor Morton*, of Philadelphia.)

Keeping the patient too in a dark room, or with his face covered with a linen mask, smeared on the inner surface with mercurial ointment, is said to have prevented pitting, (*Löwenhardt, Briquet, Gariel*), and these results have been recently confirmed in this city. (*Stewardson*, of Philadelphia.) In every case in which Dr. Stewardson applied the mercurial ointment before the fifth day of the eruption, the pustules, whether on the face or limbs, to which the application was made, aborted. In one case, he applied the mercurial ointment to one half of the face only: the pustules on this half aborted, and left no marks; those on the other half ran their regular course, and left marks. The same happened in another case, when one half the face was covered with mercurial, and the other with simple, ointment.

The treatment of smallpox by the "ectrotic method"—as it has been termed—has received great attention recently, and, in addition to the plans already mentioned, it has been proposed to pass over the eruption a pencil dipped in a solution of the nitrate of silver, in the proportion of from 15 to 45 grains to the ounce of distilled water. (*Serres*.) It would appear to be necessary, that the plan should be adopted before the fourth day, or before the eruption assumes the pustular form. (*Olliffe*.) Frictions with sulphur ointment, made of a drachm and a half to two drachms to an ounce of lard,—the first proportion for varioloid; the second for cases of confluent smallpox,—over the face and the parts that are covered with pustules, have been followed by equally favourable results. (*Midavaine*.)

When the eruption begins to dry off, and the complaint to decline, little is needed in the distinct form: the patient may have recourse to the warm bath with advantage, to remove the incrustations, and to cleanse the surface.

The secondary fever, which occurs in the confluent form, requires prudent management. If active, the refrigerant and general antiphlogistic treatment may be necessary; if, on the other hand, adynamic symptoms are prominent, the powers may have to be supported as in typhous fever.

In the different sequelæ of the disease,—erysipelas, variolous ophthalmia, variolous pleurisy, &c. the affections must be treated on general principles,—bearing in mind, that the system has just passed through a severe shock; and should scrophulous or other *vices* be developed, it will be important, if practicable, to alter all the physical and moral influences that surround the patient, by change of air, the good effects of which—as has often been remarked—are more signally displayed in the sequelæ of smallpox than in any other known disease. (*Geo. Gregory*.)

3. *Modified smallpox, Smallpox after Inoculation or Vaccination, Varioloid, Varioloides, Variolides, Variolæ modificatæ.* The most important circumstances that modify the course of smallpox are,—the effect produced upon the system, either by inocula-

tion with variolous matter, or by vaccination. When smallpox occurs, after a lapse of time, in a person who has either been inoculated or vaccinated, it is generally much milder than usual, and its course is materially interfered with. It would not seem, however, to be even a general rule, that a previous attack of smallpox renders the subsequent attack slighter. The author has known two fatal cases of secondary smallpox, and it has often been remarked, that secondary cases are generally very severe. (*Mackintosh.*)

It was not until the commencement of the last century, that inoculation for the smallpox was introduced into England from Turkey. Where it was first practised is unknown.

It was in April, 1721, that the daughter of Lady Mary Wortley Montagu was inoculated, being the first case in England; and in June, 1721, it is said to have been practised in this country by Dr. Boylston.

The operation is performed by introducing a portion of variolous matter by means of the point of a lancet under the cuticle; and the insertion of the deltoid muscle is generally chosen for this purpose, because it is convenient; and because it is a part of the arm of the female, which is never likely to be exposed by the mutations of fashion. On the eighth day from inoculation, generally, evident signs of the eruptive fever occur. At this time, the inoculated part has passed through the papular and vesicular stages, and has become a hard and inflamed phlegmon.

After the appearance of the febrile symptoms, the inflammation of the arm spreads rapidly; an areola of irregular shape appears, in which minute confluent vesicles may be traced, and on the eighth or ninth day, spots of variolous eruption appear in various, and often in the most distant, parts of the body. The severe confluent form does not, however, often occur; yet the only time the author communicated the disease by inoculation, such was the case, and it terminated fatally.

The disease proceeds through its course, in the same manner, and requires the same management as natural smallpox.

The fact, that deaths do occasionally occur from the *variola inserta* or inoculated smallpox, and that it is as communicable as the natural, was calculated to diminish the sphere of usefulness of inoculation, and to cause the discovery of Jenner to be hailed as one of the greatest blessings that have ever befallen the human family.

It was a common belief in Gloucestershire, where Jenner resided, that the cows were affected with a disease—the cowpox—which afforded security against the smallpox. He determined to put this to the test of experiment, and, by inoculating with the matter of cowpox those who had never been affected with smallpox, to discover, whether it afforded the desired protection. His experiments were crowned with entire success, and all nations now hail Jenner as one of their most illustrious benefactors.

Of the nature of vaccinia or cowpox, and the mode of communi-

cating the disease, we shall have to treat at length under another head.

At one time, it was believed, that vaccination is a complete preventive of smallpox; that, if universally practised, it would exterminate that loathsome disease, and diminish the general mortality full 9 per cent.; and, in the height of enthusiasm occasioned by Jenner's immortal discovery, none of the cases of apparent smallpox were regarded as the real disease, but something resembling it:—hence the term *varioid*, or “smallpox like.” Even at the present day, there are some who regard the numerous cases of smallpox after vaccination as nothing more than chicken-pox, in spite of the evidence, that inoculation with the matter of the varioid pustule will as certainly produce smallpox in one who is unprotected, as that from the variolous pustule; and that a miasm is given off from the body of one labouring under varioid, which can induce natural smallpox under the same circumstances.

In persons, who have been partially protected from an attack of smallpox by vaccination, the varioid presents itself generally with all the symptoms of a mild attack of variola. The fever is rarely considerable, although, at times, it is as high as in the unmodified disease; but it does not commonly continue after the appearance of the eruption. The pustules generally arrive at their height in five or six days, and their appearance is not uncommonly modified,—filling rapidly, in some cases with a turbid or milky fluid, and drying up, or exhibiting signs of desquamation by the fourth or fifth day. Doubtless, the varying character of the eruption, and the shortened duration of the disease, first gave the impression, that it was varicella or chicken-pox, which, as elsewhere shown, varies very materially in the phenomena it presents.

In other cases, no difference is perceptible between the phenomena of varioid and of natural variola. The pustules are large, distinctly umbilicated; the initiatory fever is violent; and the disease is scarcely modified, except in its duration, which is usually somewhat less. Confluent cases, likewise, occur, and, although pitting is not common, it may, nevertheless, happen. The tables, too, which were cited before, as the recorded experience of the Smallpox Hospital in London, exhibit, that it may prove fatal. The ratio of mortality is the same in London and in Germany, that is, 7 per cent. (*Geo. Gregory, Heim;*) but in France, it would appear to be much less than this; thus—according to the report of one observer, (*Villeneuve*)—of 365 cases of confirmed smallpox, occurring in persons who had been at some previous period successfully vaccinated, there were only 8 that proved fatal—giving a proportion of about 1 in 45 or 46. The author has never, in his own experience, met with an unfortunate case; but he has seen numbers in which the face was scarred. Except in these very severe cases, secondary fever is unusual.

Such are the main characters of the smallpox after vaccination. Where the disease occurs after genuine smallpox, the characters

are much the same. Frequently, however, as before remarked, secondary smallpox is extremely severe.

Treatment.—The medical management of varioloid does not differ from that of variola. Being usually mild, a simple antiphlogistic treatment is generally all that is demanded. The severer cases require the adaptation of the remedies advised under smallpox.

2. COWPOX.

SYNON. *Vaccinia*, *Emphlysis vaccinia*, *Vacciola*, *Variolæ vaccinae*, *Variolæ vaccinicæ*, *Variolæ tutoriæ*; *Fr.* *Vaccine*; *Ger.* *Kuhpocken*, *Schutzpocken*.

The cow is liable to a disease called “cowpox,” and, as before remarked, it has been a common observation, in the dairy counties of England, that persons whose occupation it was to milk cows affected with this disease were protected against the smallpox. This notion was laid hold of by Jenner, who inoculated persons with the matter of cowpox, and found that they were unsuspceptible of smallpox, even when variolous matter was inserted by inoculation. He was for nearly twenty years engaged in testing this deeply interesting and important question; and, finally, in 1798, put forth the results in his “*Inquiry into the Causes and Effects of Variolæ Vaccinæ*.” The first satisfactory experiment appears to have been made on the 14th of May, 1796, when a child, eight years of age, was vaccinated by Jenner with vaccine matter taken from the hands of a milker. In the year 1799, vaccination was commenced in this country, and confidence was so rapidly attained in its prophylactic powers, that it extended to every part of the earth, and, for the time, seemed to Jenner and to others, to be so complete a preventive of smallpox, that it required but that vaccination should be practised universally, to exterminate that loathsome disease altogether. The result has proved, that, valuable as was the discovery, and beneficial as were the effects of vaccination, the idea of extirpating smallpox from the list of human maladies was illusory. Within the last twenty years, indeed, so many cases of modified smallpox or varioloid have occurred in different countries, as to occasion serious inquiries, whether the protective power of vaccination may not be exhausted after a certain time, and revaccination be rendered necessary; or, again, whether the matter, transferred from one individual to another, in countless succession, may not become deteriorated, so as to render a recourse to the cow advisable. Of late years, both plans have been adopted.

Cowpox—the term is now used to signify the disease as induced in the human subject—passes through its regular stages as follows:—On the third day from the insertion of the virus, the puncture appears red and elevated, so as to be distinctly felt by the finger passed over the surface. On the fifth, the elevation is found to be a pearl coloured vesicle, containing a very small quantity of a thin and perfectly transparent fluid. On the eighth day, the vesicle is in its greatest perfection, umbilicated at the top, and its margin

tense and elevated above the surrounding skin. When closely examined, the structure of the vesicle is found to be cellular, the cells being from ten to fourteen in number, and the specific matter being secreted from the base.

On the evening of the eighth day, or morning of the ninth, usually, an areola forms at the base of the vesicle. This is circular; the skin becomes tense, red and painful for a considerable extent around, and the lymphatic ganglions in the axilla swell. At times, the cellular membrane participates in the inflammation, and sloughing takes place; but this is not common. The areola continues forming during the ninth and tenth days, and, on the eleventh, it begins to fade. A scab forms on the vesicle or pustule, for the eruption has been esteemed to belong rather to pustules than vesicles, inasmuch as it is filled with a kind of coagulable lymph, is umbilicated or cupped in its centre, and, at no time anterior to that at which it becomes filled with yellow pus, can the fluid be at once discharged of its contents by a puncture like a vesicle. The scab is of a circular shape, and of a brown or mahogany colour, which hardens gradually, blackens, and, finally, about the end of the third week, drops off, leaving a scar, which is characteristic. When perfect, this scar should be of small size, circular, and marked with radiations and indentations. (*Geo. Gregory.*)

At the time when the pustule has reached its height—or about the eighth or ninth day—slight febrile excitement is sometimes perceptible; but frequently there is no evidence of this, and yet the protection may be ample. Such are the phenomena attendant upon regular cowpox. At times, however, a spurious affection—*vaccinella*—supervenes on vaccination, of which there are many varieties. Occasionally, the vesicle, at an early period, becomes red and itchy, and a small acuminate pustule forms, which is early surrounded by an irregular areola. The fluid is never clear, like that of the genuine cowpox. This is one of the most common and most unsatisfactory results of vaccination, and should never be relied on.

At times, the inserted virus remains for a while latent. No appearances of development exist for a week or longer, after which the vesicle goes through its regular stages, and affords entire immunity.

Whenever it can be effected, the lymph should be taken in a fluid state, and transferred from arm to arm: where this is impracticable, it may be taken on the points of quills, or, between pieces of glass; but, in this country, the common method is to vaccinate from the scab, which, if inclosed in wax, will retain its virtues for a long period. The matter should be taken, by preference, before the formation of the areola. The general opinion, at least, is, that it is more active prior to that period; and yet, as has been remarked, the inspissated fluid forming the scab is, with us, most commonly used.

As to the relation between cowpox and smallpox, different views have been entertained. Perhaps Jenner's idea may have been correct,—that the two affections are of identical nature, and that vaccination is only a milder form of inoculated smallpox. (*Baron.*) Recent experiments seem to have shown, that the cow may be inoculated with the matter of smallpox, and that in passing through the body of the animal the matter is converted from smallpox into vaccine. (*Ceely, Thiele.*) A recent writer, however, (*Geo. Gregory,*) strongly opposes this view, and considers that “vaccination is not smallpox, but just the reverse—the antagonist principle.” —“Jenner”—he adds—“set us all so wrong by his term *variolæ vaccinæ*, that it is really difficult to get out of the false (because so well beaten) track. If he had wanted a short, expressive term, it should have been *vaccinia antivariolosa*. We should then have set ourselves to study how far the antivariolous power extended, and by what laws it is limited.”

It was at one time believed, (*Jenner,*) that the disease in the cow is produced by the matter of grease, which affects the foot of the horse, and is conveyed by the hands of the farm servants who are the milkers; but this is not established; and it has been denied, that the greasepock and the cowpock are identical.

It was before remarked, that time appears to have the effect of diminishing the amount of protection afforded by vaccination. Prior to eight years of age, it is uncommon to notice cases of varioloid or of smallpox after vaccination; but after this, varioloid is met with, and in the age of adolescence, it is by no means unfrequent. In the table, given elsewhere, of the cases of smallpox admitted into the smallpox hospital of London, in the epidemic of 1838,—of 298 cases that had been previously vaccinated, none presented themselves under five years of age; 5 between 5 and 9 inclusive; 25 between 10 and 14; 90 between 15 and 19; 106 between 20 and 24; 55 between 25 and 30; 13 between 31 and 35; and 4 above 35 years of age. (*Geo. Gregory.*)

These facts would seem to encourage the view, that after a certain time, the protective power of vaccination is greatly diminished; yet it will be observed, that after the age of thirty-five, again, the subsequent occurrence of variola is extremely uncommon.

To guard against the loss of protective power, it has been extensively urged, that revaccination should be practised; but, on this point, there has been a difference of sentiment,—some regarding it as unnecessary. The fact, however, that the true vaccine disease can be reproduced in one who has previously had it, is strongly in favour of the course; whilst, again, the records of the smallpox hospital, adduced above, would seem to show, that it can be rarely necessary before the age of ten. Extensive experiments have been made, as to the effects of revaccination, in the kingdom of Würtemberg, where vaccination has been enforced to an extent which is not practicable in freer governments. At the time, when

these revaccinations were practised, the population of Würtemberg was 1,363,298; and it appears, that during the period of five years, 208,322 children were vaccinated, leaving only the insignificant number of 271, above three years of age, still unvaccinated. The total number of cases of smallpox that occurred during the same period, was 1677, of which 354 were cases of genuine smallpox, and 1043 modified or rendered milder by previous vaccination,—being about one case of failure in every 217 persons. The total number of persons vaccinated a second time, after the lapse of a certain number of years, was 44,009; of this number, upwards of 20,000 took the disease perfectly; 9,006 imperfectly, and 15,000 not at all. It might be inferred from this, that little more than one-third of those vaccinated in infancy could be regarded as protected from smallpox; but although probable, it is not proved, that a susceptibility for cowpox is the same thing as a susceptibility for smallpox; for, if this be admitted, it would seem to follow, that the proportion of persons liable to a second attack of smallpox must be greater than is commonly believed. Thus it appears, that of 297 persons who had previously had smallpox and were pitted, 95 received the cowpox in a perfect form, and 76 in a modified form, whilst 126 resisted it altogether.

It resulted from the Würtemberg experiments, that the proportion of persons who took the cowpox well, on the second vaccination, progressively increased with the distance of time from the first vaccination. Thus, in some of the departments of the kingdom, where the revaccinated were chiefly children, the proportion of cases in which the operation succeeded was comparatively small: among the military, 14,344 in number, where the subjects were nearly all about the age of twenty-one, a much greater number received the disease; whilst in a whole department, in which the persons revaccinated were thirty years old or upwards, a still larger proportion was affected. All these results bear strongly on the expediency of a second vaccination: they have been urged, indeed, as rendering revaccination absolutely necessary for the protection of the public, (*Heim*;) and it must be admitted, that all the experience we yet have tends decidedly to countenance this view: besides, a strong argument in its favour is, that it may be productive of benefit, whilst no harm can possibly result from it.

One very important fact would seem to be fully established,—that the existence of a cicatrix or mark of the primary vaccination in the arm is no test whatever of the immunity of the individual from smallpox,—it having been found, in Würtemberg, that those with, and those without, the mark, were equally susceptible of cowpox on the second trial. Thus, of the 14,334 revaccinations among the military, 8,845, or more than half, showed what is usually considered good marks of previous vaccination; and, of this number, the success of revaccination was complete in 31 per cent.; modified in 29 per cent.; and it failed altogether in 40 per cent.; whilst of those with imperfect marks, the revaccination was

complete in 28 per cent.; modified in 26 per cent.; and total failure occurred in 46 per cent. (*Heim.*)

Results, similar to the above, have been obtained elsewhere; and recently, in this city.

Smallpox and varioloid having been unusually prevalent in Philadelphia during the spring of 1840; the physician of the House of Refuge, and the Pennsylvania Institution for the Instruction of the Blind, (*T. S. Kirkbride*, of Philadelphia,) was induced to revaccinate the inmates of those institutions. 209 children were revaccinated. In all a perfectly formed, rounded, stellated, or punctated cicatrix was found. All others, on whom this indication of previous vaccination was not discovered, were excluded from the report. Of the total number, 134 were boys, and 75 girls;—the average age was 12,—the extremes being 6 and 20. The dry vaccine scab was used in every instance to communicate the disease.

Of the 209 children with perfect cicatrices, 44, or rather more than 21 per cent. had the disease perfectly.

The results of revaccination in France give even a less proportion than this. Of 2,199 cases, in which it was performed on persons of different ages and sexes, who had been successfully vaccinated at some previous period of their lives, the operation took effect in 223 cases only,—which would give the proportion of about 1 to 13 or 14. (*Villeneuve.*)

It has long been a prevalent idea, that the vaccine matter may lose some of its efficacy in passing through so many human bodies, and that it would, therefore, be advisable to recur to the original source; and although it has been maintained, (*Professors Mitchell and Morton*,—and *Bell*, of Philadelphia,) that this view is questionable, and that vaccine matter, in its most recent state, possesses no more preventive efficacy, in reference to varioloid, than that which has been in use since the discovery of vaccination, the opposite opinion is steadily gaining ground under better opportunities for observation. (*Geo. Gregory.*)

The Royal Jennerian Institution, it is said, employs the same lymph now that has been in use since its first foundation, in 1806. The Smallpox Hospital, of London, however, changed their stock of lymph in 1837, and a marked improvement, we are told, was perceptible in the resulting vesicles. The local inflammation was more severe; the constitutional symptoms were more violent; the virus was more energetic; the most minute incision took effect, and the lymph, secreted in the pock on the 9th and 10th day, was still in an active state. (*Geo. Gregory.*) Such has been the effect of vaccine matter obtained fresh from the cow, in the year 1838, by Mr. Estlin of Bristol, England. By Mr. Estlin and Dr. Carpenter, of Bristol, the author was favoured with a few points of lymph, eleven removes from the cow; and it has been extensively used by the author, and by his friends, Professors Huston and Meigs, and by Drs. Bridges and Kirkbride, of Philadelphia, and

others. It was with this lymph, that Dr. Kirkbride performed the revaccinations referred to above; and he remarks, that although some members of the profession appear disposed to reject the new virus, from the severity of the symptoms which it induces, yet, except in three cases, he never witnessed sloughing or other unpleasant effects. His own observations, he adds, induce him to put more confidence in its prophylactic powers than in the old virus, "although this point can only be settled by time, and an enlarged experience by the profession generally."

As in the case of smallpox, some persons appear to be unsusceptible of cowpox; and singular anomalies are observed in this respect. At times, after repeated failures, the individual may take the infection, and the disease go regularly through its stages. It would seem to be a fair inference, that should this resistance to cowpox continue, there would be, for the time, an equal resistance to smallpox; but this has not been sufficiently proved; and indeed has been discredited.

3. GLANDERS.

SYNON. *Equinia*; *Fr.* Morve; *Ger.* Rotzkrankheit.

It has only been of comparatively late years, that the transmissibility of glanders from the horse to man has been placed beyond doubt, and it is one of the additions to our knowledge for which we are indebted to Dr. Elliotson; but the term *equinia*, meaning, as it does, an affection derived from the horse, as *vaccinia* means one derived from the cow, has, with much propriety, been extended by a recent writer, so as to include two different affections; the *one* a mild pustular disease, derived from the matter of grease in horses; the *other* a disagreeable scourge, of a pustular character, and proceeding from the glandered horse. (*Schedel.*)

1. *Equinia mitis*.—This occurs on the hands of those who attend upon horses and dress the heels when they are affected with grease—a disease in the horse attended with inflammation and swelling of the heels, from which, at a certain period of the affection, a very acrid thin matter exudes, which, when applied to any abrasion of the skin, gives occasion to a pustular affection. The pustules are large, very similar to those of *ecthyma*, elevated, and with a red purple tumid base. They vary in number, and this, perhaps, is partly dependent upon the degree of soundness of the skin. About the 8th day, the pustules properly deserve the name,—being filled with a fluid, that is unquestionably purulent; and, about the 10th or 12th day, they begin to desiccate, forming thick scabs, which leave well marked cicatrices.

It was at one time believed by many, and—as already remarked—even by the illustrious discoverer of vaccination himself, that the matter of grease, when applied to the udder of the cow, was the source of natural cowpox; and that it was thus applied by the same farm servants attending on both animals. Jenner, however, subsequently modified his opinion as to the cowpox being derived

exclusively from the horse. A recent writer (*Schedel*) affirms, that he has attempted to inoculate upon the teats and udders of several cows the matter from the pustules of *equinia mitis*, which occurred on the hands of a farrier; but the experiment did not produce any appearance of cowpox. A recent writer and experimenter affirms, that he has never been able to connect casual *variola vaccinae* in the cow with the matter of grease. (*Ceely*.)

The treatment of this grease-pox requires but little attention. Antiphlogistics internally, and emollient applications externally are all that are needed.

2. *Equinia glandulosa* is the disagreeable affection, which is produced by the glandered horse. The disease may occur in the human subject under different forms. *First*, under that of *simple acute glanders*, in which the nasal cavities and adjoining parts are attacked. *Secondly*, under that of *acute farcy glanders*, which appears on various parts, in the form of small tumours, that suppurate and give rise to foul ulcers. *Thirdly*. These varieties may occur separately, or they may be produced at the same time; or one may precede the other. *Fourthly*. Each form may occur *chronically*. (*Elliotson*.) It is properly remarked, however, (*Schedel*), that these and other varieties, which have been pointed out, (*Rayer*), constitute one and the same disease; that they are produced by the same specific infection, and that the acute forms are generally met with together.

Acute glanders commences with symptoms very similar to those of acute rheumatism; and, along with these, there is much heat about the nose and trachea; a copious discharge takes place from the nostrils, which become swollen; the nose and surrounding parts are of a bright red, and afterwards, livid colour; and the swelling extends to one or both of the eyelids. A profuse tenacious mucus, at first of a deep yellow, but afterwards of a bloody or dark sanious appearance, is discharged from one or both nostrils, and, at times, from the eyes. The agitation and tremor, at this period, constitute a very remarkable symptom. The skin is hot; the pulse frequent, and usually soft and weak; the respiration rapid and short; the tongue dry; the thirst intense, and the mind incoherent or wandering. Livid patches appear on the sides of the nose, cheeks or forehead, soon followed by copious sweats, and a gangrenous state of the diseased parts, succeeded by delirium, tremor, and death in a few days. This form of the disease—it is said (*Schedel*)—is seldom, if ever, accompanied with pustules or tumours.

In the large mass of cases, however, which prove fatal, pustular eruptions and tumours are seen. This form of the disease is the *Farcy glanders*—*Morve farcineuse*. The eruption, which usually appears about the eighth day, consists of large pustules in livid patches, and of small tumours on different parts of the body. The pustules are round, often umbilicated, and contain a purulent fluid, with a little coagulable lymph, in the form of a white soft sub-

stance, very similar to that contained in variolous pustules, and in the pustules induced by the application of the tartarized antimony ointment: the umbilicated form is, however, by no means constant. The size of the pustules varies from that of a pea to that of a mulberry; to which they often bear a great resemblance in their deep purple colour. Gangrene occasionally occurs in some of these.

Along with the eruption, small tumours appear on different parts of the body, having a shining red appearance, which soon changes to a dark livid brown. At first, they are hard and painful, but their surface soon cracks, and discharges a thin acrid sanies. These tumours sometimes mortify, but, more frequently, they communicate with deep-seated abscesses, formed in and between the muscular parts. They have even been found to communicate with the cavity of the thorax. Other eruptions appear occasionally at the same time; not at once but in successive crops, sometimes as late as the twentieth day.

The pustular eruption does not seem to be confined to the surface of the body. It is found in the Schneiderian membrane, in that of the frontal sinuses, mouth, fauces, larynx, and even, it is affirmed, in the mucous membrane of the intestines.

The general symptoms are, great prostration, thirst, frequent tremors, agitation and delirium, and all the cases of acute farcy glanders, yet on record, have terminated fatally. (*Schedel.*)

The discharge from the nostrils is not always apparent, and this has been explained by the matter making its way into the throat, owing to the patient lying on his back.

Examination after death has exhibited the lining membrane of the nasal cavities studded with clusters of small, flat, unequal, white pustules, with irregular ulcerations and mortified surfaces of varied extent. The septum nasi is almost always ulcerated, and sometimes perforated, and the nostrils and frontal sinuses contain a dark viscid frothy mucus. On dividing the gangrenous tumours, the muscles often appear decomposed: they are of a dark colour; exhale a peculiar fetid odour, and contain specks of purulent matter, with which the muscular tissue appears to be infiltrated. White pustular eruptions, like those in the nasal cavities, sometimes also exist in the mucous membranes of the small and large intestines. Between the muscles, too, large abscesses often form; and lymph or pus are found, at times, in some of the articulations.

Chronic glanders is not, in general, accompanied by any eruption. It is confined to one or the other nostril. At other times, tumours appear slowly and successively on different parts, and suppurate, constituting *chronic farcy glanders*. Sometimes, both affections appear simultaneously in the same individual. The disease does not essentially differ, except in tardiness, from the acute forms. Chronic farcy may terminate in acute glanders. (*Lenepveu.*)

In the acute form, death may occur in a few days; but it more

frequently happens on the twelfth day or later. The chronic variety may be protracted for weeks or months, and then terminate in health, or fatally.

Causes.—The cause of equinia is evidently the diseased secretion from the glandered horse; and the common opinion is, that absolute contact of the secretion is necessary. There is some reason, however, to believe, that it is communicable through the air by respiration. It would not seem that glanders is a very contagious disease amongst horses; for it was found, as the result of experiments in France, that of 100 horses exposed to the contagion, only seven or eight were infected; and, on one occasion, when more than 600 glandered horses were collected together at Alfort, not one of the persons who had charge of them was in the slightest degree affected.

The author has never met with a case of glanders in the human subject, and, therefore, his description has been drawn from others. The analogy between the disease and that occasioned by the reception of some other morbid poisons into the system is striking. Wounds, for example, received on dissection, or from handling the skins of animals that have died under special circumstances, induce cutaneous affections, deep-seated abscesses, and febrile phenomena of an analogous nature, and often prove fatal.

In Ireland, it would appear that glanders in man is of very frequent occurrence; so much so, that a writer of distinction (*Graves*) thinks the legislature is called on to imitate the wise example of the Prussian government in placing glandered horses under the surveillance of the police.

It would not appear, that the average susceptibility to the poison is great, as but little precaution is generally taken by grooms and veterinary surgeons. (*Graves.*)

The disease is one of an extremely fatal character, almost hopeless in its acute form, and full of danger in the chronic.

Treatment.—It is impracticable to lay down any definite plan of treatment. It has been suggested, that the chlorides of lime, or soda, should be administered internally; but it is doubtful, whether they would be of any decided efficacy. It has, also, been suggested, that they might be used as gargles or injected into the nostrils with benefit. Turpentine embrocations have likewise been advised, employed as warm as they can be borne, and turpentine has been administered internally, in very small doses, frequently repeated. (*Elliotson.*)

In the chronic form, Dr. Elliotson has found great benefit from the use of creasote. In two cases, he effected a cure in the course of a few weeks, by the sedulous employment of an injection of a dilute solution of creasote,¹ thrown up the affected nostril; combining, in one of the cases, the internal use of the remedy.

¹ R.—Creasot. gtt. j.
Aque, ℥j.—M.

In one case, which terminated favourably, a principal remedy was the frequent exhibition of emetics. (*Travers.*) Fumigated or medicated warm baths, or the vapour bath, with the fumes of sulphur, have likewise been recommended. (*Schedel.*)

In all cases, both acute and chronic, much must be left to the judgment of the practitioner; who will be guided by the particular phenomena that may present themselves. The internal use of iodine, creasote, and the sulphate of quinia, has been advised by a recent writer. (*Delaharpe.*)

SECTION V.

ARTHRITIC FEVERS.

With as much propriety as we establish a division of eruptive fevers, may we form one with the epithet "arthritic." In the former, the cutaneous affection forms only a part of the disease, and the same may be said of the affection of the joints in rheumatism and gout—the only diseases that fall under this division. There are, indeed, many points of resemblance between erysipelas and acute rheumatism. They are both certainly constitutional disorders, and the fever, that accompanies them, is not always, as has been said, (*Good,*) a cauma or inflammatory. The constitutional disease, too, generally runs a definite course, although it may, at times, perhaps, be cut short by medicine.

Between the two diseases that belong to this division—rheumatism and gout—there is much analogy; at times, indeed, the difficulty of decision as to the precise affection is so great, that the knot is cut by affirming that it is a mongrel affection, composed of both one and the other, and, therefore, termed "rheumatic gout." The essential points of difference between the two maladies will be understood by the following history.

I. RHEUMATISM.

SYNON. Rheumatismus, Rheuma, Myodynia; *Fr.* Rhumatisme; *Ger.* Muskelschmerz, Gliederreissen, Flusskrankheit, Fluss.

Rheumatism presents itself under two distinct forms—the *acute* and the *chronic*,—so distinct, that it has been questioned, whether they ought to be regarded as varieties of the same disease, or whether the former ought not to be esteemed a true arthritis, and the latter a form of neuralgia; but it may be well to postpone farther reference to this point, until the phenomena of the disease have been considered.

1. *Acute Rheumatism.*

SYNON. Rheumatismus, Rh. acutus inflammatorius, Arthrosia acuta, Myositis, Myitis, Cauma rheumatismus, Arthritis rheumatismus, Rheumatismus calidus, Rh. hypersthenicus, Synocha rheumatica, Febris rheumatica inflammatoria, Rheumatic fever, Acute articular rheumatism; *Fr.* Rhumatisme aigu, Fièvre rhumatismale; *Ger.* Entzündlichfieberhaften Rheumatismus.

This painful affection has been long known, and its manifest phenomena have been well described; but, as elsewhere remarked, one of the most remarkable and interesting circumstances attending it—the supervention of pericarditis and endocarditis—has been well depicted and understood of comparatively late years only.

Diagnosis.—The disease generally commences with the ordinary prodromic signs of fever; after which the pyrexia develops itself, and the febrile symptoms run, at times, exceedingly high; the skin being pungently hot, and the pulse strong, quick, full and bounding,—beating, occasionally, 100 or 120 times or more in the minute. From the first, there is more or less pain or stiffness in the joints, which soon augments to acute pain, so that the greatest suffering is occasioned by any attempt to move the joints. When the affected joints are examined, they are generally found red, swollen, and extremely painful to the touch. At times, however, where the suffering is intense, but little evidence of inflammation may be perceptible. The pain is always worse during the night, which tends not a little to the aggravation of the patient's sufferings.

It rarely happens, that acute rheumatism is restricted to one joint; not uncommonly, almost every joint of the extremities is affected, so that the patient is compelled to remain in the position in which he may be placed. Fortunately, however, it happens, that the inflammation rarely continues intense in any one joint for a length of time; a remission takes place, during which he has some alleviation of his sufferings; or, what frequently happens in the course of this “changeable phlegmasia,” it leaves one joint, to a greater or less degree—sometimes entirely,—and shifts its seat, or extends itself to another; and in this manner, the disease gradually wears itself out. It is this mobility, however, which gives occasion to the only danger that attends the disease. It is essentially, perhaps, seated in the fibrous and muscular tissues,—sometimes in one, at others in both, whence it may extend to the serous tissues; and, hence, an extension, or metastasis or translation, for it is not positively settled which, takes place—occasionally from the joints to analogous tissues, as the fibrous membrane surrounding the heart, whence it extends to the serous layer of the same; and, not unfrequently, the serous lining of the cavities of the heart—the endocardium—becomes implicated. So long as the disease continues in the fibrous and muscular tissues surrounding the articulations, it does not affect structures which are essential to life, but when it spreads to analogous structures connected with the great vital organs, it assumes a most serious character.

It has been remarked, that the fever which usually accompanies acute rheumatism, presents signs of great activity; and, when blood is drawn, it exhibits important modifications in its character: the buffy coat is always very thick; the blood is decidedly loaded with fibrine, and, owing to the powerful action of the heart and arteries, it is florid, and sometimes issues from the vein with a distinct pulsation; yet, what is singular, the skin—although far above the natural temperature—is often bathed in the most profuse perspiration;—large beads of sweat, of an acid odour, covering the forehead; and the bed-clothes being often literally wet with the secretion. The tongue is usually moist, but is more or less loaded with a white mucous covering, and is frequently red, especially around the edges. The appetite is generally impaired; but the digestive function may go on without much modification, the bowels being regular; or, if constipated, slight doses of cathartics are sufficient to excite them to action. The thirst—as in all febrile diseases—is considerable, but not so much so, perhaps, as in others, and the encephalic functions are generally unaffected. The urine is remarkable for the quantity of uric or rosacic acid which it contains. (*Andral.*)

Under the head of Pericarditis and of Endocarditis, the connection of those affections with the disease now under consideration was treated of. It has been presumed, of late years, that this connection is infinitely more frequent than it was formerly, and even recently, imagined. A late writer has expressed the opinion, that about one half of those who suffer under violent acute articular rheumatism are affected with pericarditis, (*Bouillaud*;) and we know, that endocarditis is a common accompaniment. It would appear, indeed, that the origin of these diseases of the heart is frequently in acute rheumatism;—for of 92 cases of pericarditis or endocarditis, 31—that is, 17 cases of pericarditis, and 14 of endocarditis—coincided with articular rheumatism. (*Bouillaud.*)

One of the most important points, therefore, in the investigation of the disease, is to watch the supervention of the morbid action in the fibro-serous tissues of the heart. It is not necessary to repeat here the symptoms of pericarditis and endocarditis,—but the occurrence of dyspnœa, with more or less anxiety; jerking, or feeble and rapid pulse, and tumultuous action of the heart, ought to direct the attention of the practitioner to that viscus; and if he discovers, by the physical signs and the functional phenomena, the existence of inflammatory action there, it must be treated as if the disease were unconnected with rheumatism; for nothing is better established, than that, although primary rheumatism, seated in the fibrous and muscular tissues around the joints, is remarkable for its great and rapid change of seat, secondary rheumatism—if it may be so termed—loses this mobility when it fixes upon a serous membrane. (*Andral.*)

It may be proper to remark here, that the *bruit de soufflé* or bellows' sound, on which so much stress has been laid as an evi-

dence of endocarditis, was found by a recent observer (*Chomel*) to be present in not more than about one in every three cases, and that he detected it in other acute diseases, in which there was no reason to suspect any complication of cardiac disturbance, viz. in five cases of pneumonia, three of which recovered and two proved fatal; in three cases of smallpox; in one case of typhoid fever; in two cases of bronchitis, and in several of acute metritis; whence M. Chomel concludes, not only that this auscultatory sign is far from being constant in acute rheumatism, but also, that it is not unfrequently present in other acute diseases: still, where it does exist, it is a symptom of value. (*W. Budd.*)

As the disease may attack all fibrous, fibro-serous, and muscular structures, it is easy to see, that we may have rheumatism of the diaphragm, meninges of the brain, sclerotica, stomach, intestines, bladder, capsules of the kidney, liver, &c. &c. The occurrence of severe pain in the stomach, in the course of an attack of acute articular rheumatism, or independently of it, may indicate rheumatism of the stomach. When it attacks the intestines, the pain is often excessively severe, and shifts from place to place—that is from one part of the muscular coat to another. In the bladder, it is indicated by severe pain in the hypogastric region, and behind the pubes, with retention of urine perhaps in most cases; and when it affects other parts, the seat and character of the pain will usually lead to an accurate diagnosis: not long ago, the author had under his care a case of what seemed to be rheumatism or gout of the intestines—neuralgia certainly—which occasioned intense suffering, but terminated favourably after a continuance of two or three weeks.

The duration of acute articular rheumatism varies. At times, though rarely, it terminates in health in the course of a fortnight, but far more frequently, even when confined to the joints, it runs on for a month or six weeks. Whilst restricted to the joints, as already observed, it may be considered devoid of danger; but, when pericarditis or endocarditis supervenes, there are two sources of apprehension:—the disease may terminate fatally in the acute stage; or it may become chronic, and the issue be unfavourable; or, lastly, it may give occasion to chronic heart disease, which may lay the foundation for dropsy; from which, the patient may ultimately recover, or at least pass comfortably through life, the system having become accustomed to the modification in the structure of the organ. Recovery is more frequent from the endocarditis than from the pericarditis of rheumatism.

Causes.—Nothing perhaps seems more established than the agency of exposure to cold in the production of acute articular rheumatism, as well as of the chronic form; yet the disease cannot always be traced to this cause. Sitting in a draught, which gives occasion to irregularity of capillary action in the part exposed to it, is proverbially a cause—not only of rheumatism, but of almost every

other malady: the same effect follows sleeping in damp sheets, remaining long in wet clothes, and, in fact, any exposure of a part of the surface of the body to cold and moisture, especially when other parts are protected against it, (*Andral*,) or when the body is in a state of active perspiration. (See, on this subject, the author's *General Therapeutics*, Phila. 1836.) It would seem but probable, that these disturbing influences should cause acute articular rheumatism, as they appear to do other diseases, and especially neuralgia or chronic rheumatism; yet this has been denied by an eminent pathological writer. (*Chomel*.) He considers, at least, that the influence has been exaggerated; and it must be admitted, that predisposing agencies must exist, which are by no means easy of appreciation. These have been supposed to consist in too great activity of hæmotosis, great sensibility of the skin, and very considerable development of the capillary system of the surface, (*Roche, Andral*;) but this does not seem to be a sufficient explanation. There can be no doubt, however, that previous attacks lay the foundation for a strong predisposition. It is, indeed, a disease which is extremely liable to recur. It has appeared, also, to the author, that a predisposition may be laid in organization. He certainly has seen some severe cases of acute articular rheumatism in those whose progenitors had suffered from the same condition. No one denies, that a predisposition to gout may be engendered in this way, and it is not difficult to imagine, that a similar predisposition may exist in this congenerous affection.

Acute articular rheumatism generally attacks young persons, or adults. The author has met with many cases, about the age of puberty; and as far as his experience has extended, the number of females has appeared to exceed that of males. It may occur at all seasons, but is most common, perhaps, late in the spring, or in the early part of summer,—a period of the year in which the agency of cold would seem to be more limited than in the autumn, winter or early spring. This circumstance has influenced the author in the opinion, which it has been necessary for him to give in one or two cases, where rheumatism had previously attacked the heart, and where the question was, whether it was advisable for the individual to subject himself to serious inconvenience in order to spend his winter in a warm climate with the view of escaping the disease. In neither of the cases did the persons suffer during the following winter by remaining at home.

Other causes have been enumerated—such as the repercussion of eruptions, the stoppage of an accustomed flux, &c. These may exert some influence, if a predisposition exists; but such influence is not easily appreciable. Recently, it has been affirmed, that where there is a disposition to acute rheumatism, the use of copaiba may develop it. (*A. B. Maddock, Sigmond*.)

Pathological characters.—It does not often happen, that opportunities occur for examining the textures around the joints, whilst

the inflammation is active in them. The disease, as already remarked, rarely proves fatal, except by the supervention of inflammation in some of the fibrous or muscular tissues that are seated internally, and then the mischief there is so predominant, that, for some time before death, the joints cease to be the source of suffering. It has never occurred to the author to meet with a case of suppuration or of gangrene of the joints, but these terminations have been witnessed. (*Bouillaud.*) Under these circumstances, it is not surprising, that pathologists may differ as to the precise seat of acute rheumatism of the joints. It has been already observed, that it invades every muscular and fibrous tissue, and that ultimately the serous membranes may become implicated. Such may be the case in the articulations,—the synovial, which is a serous membrane, becoming affected last.

On dissection, no decisive appearances may be met with. At other times, the veins around the articulations have been found gorged with blood—the ligaments, periosteum and synovial membrane being injected and thickened; small collections of matter have been found in the surrounding cellular tissue, and accumulations of pus or serum in the cavity of the synovial membrane. (*Andral.*)

It is clear, that the hyperæmia, howsoever induced, cannot, in acute articular rheumatism, occasion any great organic changes—inasmuch as in the course of a few hours, it shifts its seat and leaves behind no evidences of its previous existence. This mobility has given rise to the opinion amongst many, that the disease is essentially seated in the nervous system; that the sanguiferous system is affected secondarily; and that it is very probable the nervous filaments of the diseased parts are more considerably involved than any other tissue. (*Mackintosh.*) The writer, just cited, remarks, however, that he has seen cases, which presented symptoms similar to those of rheumatism, in which, after death, the lymphatics of the limb were found inflamed, and filled with a puriform fluid. Some, again, have considered acute rheumatism to be nothing more than acute inflammation of the lining membrane of the arteries. The whole disease is certainly peculiar, and appears to be more neuropathia than ordinary inflammation. Its extremely changeable character sanctions this idea, and the remedies, that are found serviceable, are not always those which we should think of prescribing in ordinary active phlegmasia.

Treatment.—Difference of opinion has existed in regard to the management of acute articular rheumatism; and the results of treatment have tended to much of that diversity of sentiment which has existed in relation to the pathology of the disease. It has been already remarked, that although it doubtless is, when developed, inflammatory, the neuropathic condition, which probably exists primarily, cannot be lost sight of. The general inflammatory diathesis, the local inflammation of the parts, and the buffed state of the blood are arguments brought forward by those who recommend the vigorous use of the lancet; but it must be borne in mind,

that the inflammatory state is peculiar; that the skin is often hot, and yet bathed with perspiration,—that the affection as rapidly leaves a part as it attacks it; that the ordinary signs of inflammation are not seen in necroscopic investigations; and that the buffed condition of the blood is not an exclusive evidence of inflammation, but that it prevails in diseases, unquestionably neuropathic, that are attended with great velocity of the circulation. Attacking the frame, however, so vigorously as it usually does, it is not surprising that, at all times, there should have been advocates for the free use of the lancet. Blood-letting is, indeed, one of the remedies most frequently, and, in certain states, most judiciously brought against it. Recently, however, the profession have been startled by the extent to which it has been recommended. (*Bouillaud*.) The formula, proposed by M. Bouillaud, is the following:—on the day of the admission of the patient—supposing him to be well constituted and in the vigour of life—at the evening visit, a bleeding of four cups is practised. On the second day, a double bleeding from the arm, of three cups, and a cup and a half; and between these bleedings, local blood-letting, either by leeches or by cupping-glasses,—the local blood-letting to take away three, four, and even five cups of blood. The leeches and cups to be applied around the joints most affected, and on the præcordial region, when the heart is seriously implicated. On the third day, the patient is bled from the arm, and a second application of cups is made either to the præcordial region or around the articulations. If, on the fourth day, the fever, pain, tumefaction, and, indeed, the whole inflammatory process has yielded, which is sometimes the case, (*Bouillaud*), no more blood need be taken. In the contrary case, another bleeding from the arm, to the extent of three or four cups, is practised. On the fifth day, the resolution of the disease, according to M. Bouillaud, is generally in full activity. In very severe cases, however, the rheumatic fever may be still so marked, that a bleeding from the arm to three cups, or local blood-letting to the same amount may be advisable. On the sixth, seventh, or eighth day convalescence is manifest, and nourishment is allowed the patient.

Such is the prescribed formula of M. Bouillaud, for arresting acute articular rheumatism,—“strangling it,”—to use his own expression—by bleeding *coup sur coup*. The author has had recourse to it in what appeared to him to be favourable cases, but the results have not been equally fortunate; and it has seemed to him, that the too vigorous use of the lancet has occasionally rather favoured the shifting of seat, which has so much to be dreaded. If the disease be really neuropathic essentially, and the phlegmasia the consequence of this, it can be understood, that the too great abstraction of blood may develop the nervous impressibility, and, in this manner, constitute a predisposition to other tissues becoming implicated.

It can, of course, only be admissible, in vigorous individuals; and even in them, the more sparing use of the lancet, with the adjuvants

to be mentioned hereafter, appears to be less liable to objection. There are cases, indeed, in private practice, and most of those that are seen in our eleemosynary institutions, in which any abstraction of blood from the general system could not fail to prove injurious. Weak, nervous, impressible persons, especially if they have led a life of dissipation, and the dissolute of all kinds, cannot fail to have the neuropathia increased by the employment of the lancet.

At the commencement, then, of the disease, blood-letting will commonly be indicated, and it may be necessary to repeat the bleeding more than once in the early days; and, throughout the disease, local blood-letting, by means of leeches, may be needed, where the inflammatory symptoms run high. The medium quantity of blood recommended by Bouilland to be lost, in well constituted subjects, in cases of intense, acute, articular rheumatism, is four or five pounds; but it may be necessary, he says, to go as high as seven or eight pounds. In light cases, he does not exceed two or three pounds.

As an adjuvant to general blood-letting, the tartrate of antimony and potassa has been highly extolled of late years, and there are cases, in which its sedative influence has been markedly advantageous. The author has frequently administered it under the restrictions and inculcations detailed under another disease, (see Inflammation of the Lungs, Vol. I. p. 313,) and occasionally with good effects. It has appeared to him, however, that the antimony has acted most beneficially where it has produced nausea, and the nausea has been kept up two or three days in succession. The joint sedative and revellent agency has seemed to break in upon the neuropathic and vascular erethism. It is probably in this way, that most of the narcotics and acro-narcotics exert their salutary agency. The author has not found them decidedly efficacious unless their peculiar effects upon the system were clearly evinced.

The plan of treating acute articular rheumatism by opium has been long practised, but the remedy was generally given in the form of Dover's powder—the pulvis ipecacuanhæ compositus—which is a celebrated diaphoretic, rather than with the view of exerting the specific effects of opium on the system: the general feeling has, indeed, been to administer diaphoretics; notwithstanding that the skin may have been even at the time bathed in profuse perspiration. Opium has, however, been given with another object—to induce narcosis, and establish a new impression and action on the nervous system. Care must, of course, be had not to push the remedy too far, and yet to keep the patient clearly under its influence. With this view, any of the preparations of opium may be prescribed, but the soft pill is as efficacious as any other,¹ or the acetate or the sulphate of morphia;² or the pulvis ipecacuanhæ compositus; but the last can be rarely given in quantity sufficient for the opium to produce its narcotic action, without the ipecacuanha disordering the stomach.

¹ R.—Opii, gr. j.
Ext. hyoscyam. gr. iij.—f. pil.
ter die sumend.

² R.—Morphiæ acet. gr. j.
Mucilag. acaciæ,
Syrup. aa ʒss.
Aquæ, ʒiv.—M.
Dose, a spoonful, every hour.

Ipecacuanha is frequently, however, combined with opium, and administered for the object to be mentioned presently.

Of the acro-narcotics, or those vegetable articles of the materia medica, which, in large doses, irritate the lining membrane of the stomach and bowels, and, at the same time, induce narcosis, no one has, of late years, been so much employed in this disease as the colchicum autumnale. It is doubtless, at times, effective; but it very frequently fails even when administered with due intelligence and care. A recent writer, indeed (*W. Budd*), expresses his conviction, from the observation of numerous cases, of its entire inefficacy,—a conviction which, he says, is held by many physicians of great experience. When it has been beneficial it has been pushed to the extent of slightly affecting the system, as shown by nausea, or vomiting and purging, with some cerebral confusion. The author cannot be mistaken in referring beneficial effects to it, when the system has been kept, for some time, under its operation. When administered, however, to a less extent, he has not seen any good results from it, although he has prescribed it in numerous instances. Various preparations are employed:—the powder (gr. iij—x, three or four times a day); the vinum colchici radici (gtt. x. three times a day); the extractum colchici aceticum of the London Pharmacopœia (gr. j—ij, three or four times a day); the tinctura seminum colchici, in the same dose as the wine of the root; and the vinum seminum colchici. The London Pharmacopœia has a compound tincture of colchicum, made by macerating two ounces and a half of bruised colchicum seeds in a pint of aromatic spirit of ammonia, which is much used by the British practitioners.

Aconitia, veratria, and delphinia have likewise been used, both internally and externally.

R.—Aconitiæ, seu Delphiniæ, seu Veratriæ, gr. iv.
Alcohol. ʒj.

Dose, ten, fifteen, twenty to twenty-five drops, in a glass of water.

The tincture may also be applied externally, and it is said with advantage. (*Turnbull, Magendie.*)

The cimicifuga,¹ carried to the extent of producing catharsis, and even slight narcosis, has likewise been of service.

¹ R.—Rad. cimicif. contus. ʒj.

Coque paulisper in aquæ Oj.

Dose, one to two fluid ounces, several times a day.

In a disease, which is thus benefited by new impressions made upon the alimentary canal and on the nervous system generally, it might be presumed that revellents in general would be found to be of service. Unfortunately, owing to the self-limited tendency of the

disease, these advantages are less than might be anticipated *a priori*. This is the case with the calomel and opium treatment, pushed so as to excite ptyalism, aided or not by the application of mercurial unguents to the inflamed parts. The inconveniences too, of the ptyalism are often so great as to completely overpower any benefit that might have been anticipated. It is not surprising, consequently, that a recent author (*Mackintosh*) should thus express himself on this matter. "I can say nothing, except in condemnation of another plan too indiscriminately followed, viz. the calomel and opium treatment. I have often seen the tongues of patients swollen and ulcerated, and profuse salivation produced, without the least signs of amendment." He properly, also, animadverted on the "old plan of sweating patients for ten or fourteen days, by means of large and repeated doses of Dover's powder, warm diluents and a load of bed-clothes," and expresses the hope that it is now very generally abandoned, "as it is attended with the same injurious effects as too frequently repeated and indiscriminate bleedings." The plan is still, however, pursued by some practitioners to the great distress of the patient, who generally sighs for ice-cold drinks, and a comfortable temperature.

Purging, which is such an excellent revellent in many cases, would be here inadmissible on account of the suffering that necessarily attends the repeated evacuation of the bowels when the joints are so painful; but it is important to keep the bowels open, which is, in general, easily accomplished by the milder cathartics, as castor oil (ʒij.), or rhubarb and magnesia,¹ or any gentle cathartic pill. (*Pil. aloes*, gr. viij.; divide in pil. ij.—to be taken for a dose.)

¹ R.—Pulv. rhei, magnes. āā gr. x.

Pulv. zingib. gr. iv., seu

Ol. carui, gtt. iij.—M.

Of the different revellents, cupping on the back has appeared to have been most frequently attended with happy results. (*Professor Mitchell*, of Philadelphia.) An idea has been entertained, that this has been owing to the depletion and revulsion effected near the origin of the nerves that are concerned in the articular inflammation. Whatsoever view may be entertained on this matter, it is unquestionable, that the highly sensitive integument of the back is an excellent locality for revulsion in many diseases; and it is not necessary, that the mischief should be directly or indirectly connected with the spinal marrow or its sheath to explain this. The author has seen the intense suffering in the joints as effectively relieved by cupping over the loins as by any other agency.

Such is the plan of internal management, which would appear to be best adapted for all cases, except such as present themselves in debilitated constitutions, and under circumstances of asthenia, which appear to forbid its use;—Bleeding—general and local—over the joints; the use of narcotics and acro-narcotics, and revulsive bleeding on the back. Some, however, and individuals of no little note in their profession, (*Willan*, *Haygarth*,) under the

view that the disease is neuropathic rather than inflammatory, have recommended an opposite course. "The ill success of it," (bleeding,) says Willan, "probably first induced other practitioners to adopt an opposite plan; when it was found that Peruvian bark, and vitriolated iron, or the precipitate of it combined with myrrh, as recommended by Dr. Griffiths, afforded both speedy and permanent relief;" and Dr. Haygarth came to the conclusion, from his observations, that "bark does not cure an ague so certainly and so quickly, as it does the acute rheumatism."

The results of the experience of these and other eminent practitioners is in favour of the view, more than once expressed, that this inflammation is peculiar; and that, like the inflammation of erysipelas, it may not always require the vigorous use of antiphlogistics.

The author has had numerous opportunities for witnessing the exclusive use of both modes of treatment; and it is but proper to say, that he does not recollect, in any case, to have seen the symptoms aggravated under the prudent employment of either. In the mass of cases that occur, except in very active, vigorous habits,—and it is generally applicable even to them,—a combination of the two modes of treatment has appeared as advantageous as any other course,—treating the disease, during the early period, by the ordinary antiphlogistics, and afterwards endeavouring to modify the neuropathic condition by the cautious employment of tonics, as the sulphate of quinia.

R.—Quiniæ sulphat. gr. iv.

Acid. sulph. dil. gtt. x.

Aquæ, ℥vj.—M.

Dose, a fourth part, four times a day.

But if tonics may be admissible, and even advisable, under the circumstances mentioned, it can rarely or never happen, that powerful excitants, as spirituous liquors made into toddy or punch, or a bottle or two of port wine daily, said to be generally prescribed by some, can be necessary; nor has the author seen any benefit from stimulating articles, like the guaiacum, and other reputed diaphoretics of the excitant class. If adapted for any form of the disease, it must be the chronic.

Recently, the iodide of potassium has been recommended, both internally¹ and externally,² and it is said to have rendered essential service.

¹ R.—Potass. iodid. ℥i.

Aquæ destillat. ℥i.—M.

Dose, ten or fifteen drops, three or four times a day.

² R.—Potass. iodid. ℥ss.

Adipis, ℥j.—M.

Half a drachm, to be rubbed on the affected parts night and morning.

In regard to external applications to the affected parts, the author is not disposed to say much in their favour. Advantage is, doubtless, derived, occasionally, from the application of leeches over the inflamed and tumefied surface. As to blisters, great difference of sentiment has existed. By one, (*Mackintosh*), it is

affirmed, that blisters ought never to be employed, at least in the early stages, "unless there be evidence of pericarditis, or some other internal organ." But even under the circumstances last mentioned, the propriety of applying blisters to the inflamed joint may be questionable, and the author may repeat here what he has said elsewhere, that he has over and over again attempted, by revellents, to bring back the changeable phlegmasiæ to their primary seat, when they have attacked other tissues, and yet he does not recollect, either in his own practice, or in what he has witnessed in that of others—in public or in private—a solitary instance where such an appeal has been responded to; and that, accordingly, he now attends exclusively to the superinduced affection; for in the cases of pericarditis and endocarditis, which are so often observed as concomitants of acute rheumatism, any loss of time might be serious. "It is, indeed, by no means clear, that the artificial irritation, which we excite by revulsives, can be practised, in such cases, with perfect impunity. We must bear in mind that the inflammation, which has changed its seat, was originally situate in the part we desire to irritate artificially; and it might be asked, with much propriety, whether the revulsive irritation we induce may not equally pass to the organ secondarily implicated, and add to the mischief already existing; so that, in truth, revulsives might be less safe and efficacious there than when applied to other parts of the economy." (The author's *Therapeutics*, p. 348: Philad. 1836.)

Did doubts, indeed, exist in the mind of any practitioner, in regard to the use of blisters in rheumatism, they would not be dispelled by consulting some of our most approved therapeutical writers. Whilst one (*Professor Chapman*, of Philadelphia) thinks they are calculated to fasten down arthritic affections on the extremities; another (*Cullen*) affirms, that he has so frequently seen the most alarming translation of the inflammation to the vital organs, that he cannot too strongly denounce their employment. Both opinions appear to be hypothetical. The author is not in the habit of prescribing blisters to surfaces affected with acute rheumatism; but he has often seen them so prescribed, and he has never witnessed either of the effects described; nor is he prepared to say, that any advantages have accrued from their use to compensate for the irritation they have occasioned.

Emollient cataplasms and warm fomentations have been advised, but they are seldom useful; and although the warm bath might appear to be indicated, evil results from the necessary motion of the joints which it requires. Cases, which have reduced the individuals to the condition of cripples, and which have belonged to the subacute and chronic forms, have been wholly restored by prolonged immersion in the natural bath of the temperature of the body—like that at the Warm Springs and the Hot Springs of Virginia. The artificial bath fails, in consequence of the impracticability of maintaining the water of the bath at the same elevated temperature.

The colchicum is sometimes applied externally to rheumatic joints as a liniment, in the form of the tincture of the seeds or bulb. (*Mérat* and *De Lens*.) Recently, it has been advised (*Laycock*) to be combined with the tincture of camphor,¹ and applied to the joints: it has been used in the author's clinique at the Philadelphia Hospital with relief, but whether the colchicum was an important agent, the author was unable to decide. The tincture of camphor, used alone, certainly seemed to exert the same effect.

¹ R.—Tinct. rad. colchic.

Tinct. camphoræ, āā partes æquales.—M.

The application of methodical compression around the affected joints, by means of a flannel bandage, is often productive of great relief. It was advised, many years ago, (*Balfour*), and has been revived. (*Allan*.) It is especially serviceable when there is great effusion. It has been advised (*Bouillaud*) that the compression should be made by means of compresses covered with mercurial cerate; and that a position and attitude should be given to the limb that would be most favourable to resolution. An elevated position would certainly prevent the engorgement of the parts. (*Piorry*.) The author has seen good effects from compression, and a simple flannel bandage is all sufficient.

Lastly, the diet requires regulation throughout the disease. Whilst the antiphlogistic treatment is considered to be necessary, it should be directed according to the rules laid down under febrile and inflammatory affections in general, and, subsequently, it may be improved; but great caution is requisite on this head, as errors in diet are a very common cause of the recurrence not only of this but of every febrile disorder that is liable to relapse.

Dengue.

SYNON. Dingee, Dunga, Dandy, Bouquet fever, Bucket fever, Rheumatismus febrilis, Scarlatina rheumatica, Exanthesis arthrosia, Eruptive articular fever, Eruptive rheumatic fever.

Some of the appellations given to this singular affection sufficiently indicate the difference of sentiment that has existed in regard to its nature. The origin of its popular name appears to have been derived from the English negroes of the Island of St. Thomas, by whom it was called the "Dandy Fever," owing to the stiff affected gait induced in those labouring under it. When the disease occurred in Cuba, the word *Dandy* was corrupted, in Spanish pronunciation, into *Dunga* or *Dengue*, by which it was known in the southern states.

The disease first made its appearance in the Caribbean Islands in the latter part of 1827, whence it spread over the West Indies, and, in the following year, to the southern coast of the United States. In the spring and autumn of that year, it appeared with severity in New Orleans, Pensacola, Savannah, Charleston, &c. At the close of the year 1828, it became gradually extinct, and has never since recurred. "Like the *black death*, the *sweating sick-*

ness, and *cholera asphyxia*, it soon disappeared, leaving behind naught save the terror of its name. Fortunately, however, its history, unlike these epidemics, was distinguished less by its fatality than mere suffering. In the annals of medicine, there is not perhaps recorded a disease so severe in its accession and duration, and so seldom leading to a fatal issue." (*Surgeon-general Lawson's "Statistical Report."*)

Diagnosis.—The disease was generally ushered in by febrile symptoms of an inflammatory character, accompanied by a painful affection of the joints and muscles. On the second or third day, the fever declined, and with it the articular pain,—the attack terminating in a copious perspiration, occasionally attended with a rash or miliary eruption, which was esteemed, however, as only an incidental symptom. On the third or fourth day,—the fever having in the meantime intermitted,—more or less gastric disorder appeared, and on the fifth or sixth day, a cutaneous eruption, which resembled scarlatina more than measles, but was less confluent than either of those affections, and consisted of minute florid red papulæ, slightly elevated, and distributed in irregularly shaped patches, appearing first on the face and trunk, and spreading to the extremities. On the full development of the eruption, a second febrile exacerbation, with severe arthritic and muscular pains, occurred. After two or three days duration, the eruption gradually disappeared, with some desquamation of the cuticle. In some cases, the lymphatic ganglions of the neck, groin and axilla remained swelled for a long period.

The disease has by many been classed amongst the exanthemata; but it would appear to partake of the nature of both eruptive and arthritic fevers. It scarcely ever proved fatal, unless when complicated with accidental morbid conditions. (*Surgeon-general Lawson, Dumaresq, Professor Dickson, of Charleston.*)

Causes.—It appears to have attacked all conditions and both sexes; so as to give rise to the question, that always occurs in similar visitations,—whether its spread were owing to atmospheric causes or to contagion? It is affirmed to have extended gradually from place to place, following the great routes of commercial intercourse, and not to have been influenced in its progress by season, locality or atmospheric changes. (*Professor Dickson, of Charleston.*) The evidence, however, of its contagious nature has not been esteemed conclusive. (*Surgeon-general Lawson's Statistical Report.*) One writer, who saw it at Cuba, was led to consider the specific cause of it and yellow fever to be the same, (*Osgood*;) another writer (*Waring, of Savannah*) considers it to have been closely analogous to the "breakbone fever" of 1826, and the epidemic fever of 1827, "which last, like the *breakbone* fever of 1780, described by Rush, is a plain bilious remittent fever." (*Army Statistical Report.*)

Treatment.—The lancet was generally found necessary during the inflammatory period; with cathartics and antiphlogistics gene-

rally. Anodynes were likewise required to allay the violence of the pain.

2. Chronic Rheumatism.

SYNON. Rheumatismus chronicus, Rh. vulgaris, Rh. inveteratus, Rh. habitnalis, Rh. frigidus, Arthrodynia, Arthritis arthrodynia, Arthrosia chronica, Rheumatalgia; *Fr.* Rhumatisme chronique; *Ger.* Chronische, inveterirte, habituelle Rheumatismus, Langwierige Gliederreissen.

The chronic form of rheumatism is described as being frequently a sequel of the acute. (*M. Hall.*) This does not accord with the experience of the author. So far as his observation has gone, the subjects of acute rheumatism rarely suffer from the chronic form; and, on the other hand, persons who are constantly more or less crippled by chronic rheumatism, pass through life without suffering, perhaps at all, from the acute. Partly for this reason, chronic rheumatism has not been considered by some as a variety of the same disease as the acute, but rather as a form of neuralgia. The fact, however, that a permanent contraction of the limbs, and, at times, ankylosis of the joints sooner or later supervenes, shows, that the fibrous and muscular tissues become involved sooner or later. It so happens, however, that the treatment, which is appropriate for the one, is equally so for the other. There is usually not much difficulty in the diagnosis of these cases. The pain is fixed in the part, but there is not swelling or redness as in acute rheumatism. Chronic rheumatism is very rarely seated internally, but it is stated, that it may affect the heart, stomach, intestines or bladder. (*Andral.*)

The affected limbs, in process of time, lose their power of motion, fall away, and lameness results; but the disease exists in all degrees. Usually, too, the affected muscles become atrophied, partly perhaps from disease, and partly from disuse.

It is induced by the same exciting causes as acute rheumatism; but, unlike the acute form, it is relieved by warmth—as by that of the bed.

Periostitis—induced by syphilis, mercury, or cold—may be mistaken for it; but periostitis is usually seated in the long or flat bones, and, in the former, between the joints. The pains, too—*osteocopi*—are exceedingly severe during the night.

The army medical statistics seem to show, that rheumatic affections are most common in the dry and cold atmosphere of the interior, at the posts north of lat. 39°, and remote from the ocean and inland seas, which are characterized by the great range of the thermometer, and by seasons that are strongly contrasted; and it has been properly remarked, that were cold, moisture, and sudden alternations of temperature powerful exciting causes, the highest ratio ought to occur on the New England coast, and the northern chain of lakes. (*Ferry, U. S. A.*) Similar results appear to have been obtained by the British army statisticians.

Treatment.—It can rarely be necessary to bleed from the gene-

ral system in chronic rheumatism; but should the pain be very severe, it may be important to apply leeches or cups over the affected part, and to repeat the operation should the symptoms indicate that this course is necessary.

The sudorific plan of treatment is here more strongly indicated than in acute rheumatism. There can be no danger of adding to febrile excitement, for none such exists. Accordingly, the stimulating diaphoretics have been given freely, especially the guaiacum, alone, (*P. guaiac.* gr. x, or *tinct. guaiac. ammon.* ℥j, every three hours,) or in combination with Dover's powder or sulphur,¹ or with colchicum,² and the hot infusion of the eupatorium perfoliatum.³

¹ R.—Pulv. guaiac. gr. x.

Pulv. ipecac. comp. gr. iij. vel

Sulphuris, gr. vj.—M.

One, to be taken every four hours.

² R.—Tinct. sem. colchic.

Guaiac. simpl. āā ℥iij.—M.

Dose, thirty or forty drops, three times a day, or oftener.

³ R.—Eupator. perfoliat. ℥j.

Aq. bullient. Oj.

Dose, an ounce and a half to three ounces, every three or four hours.

The hot water is evidently, however, an important ingredient. This very day, (April 21, 1841,) the author has seen a case of chronic rheumatism, in which profuse diaphoresis was occasioned by the hot infusion of chamomile. The eupatorium was directed, but the article not being at hand, the chamomile was substituted.

The aconitia, delphinia, or veratria, may be administered, as advised under acute rheumatism; but more reliance is perhaps to be placed upon them when used in the form of friction, (p. 384 of this volume.) These remedies were brought forward with too high pretensions, but they were undoubtedly beneficial at times. Unless, however, the friction occasioned a full development of the peculiar impressions caused by the aconitia when rubbed on the skin, no benefit whatever was to be looked for from its employment, (*Turnbull*;) and it is remarked by the writer just cited, that if there be the slightest abrasion of the skin, an application of such activity should not be resorted to, and that it should be carefully kept from coming in contact with the mucous membranes.

The codliver oil—*oleum jecinoris aselli*—has been highly extolled by different writers, (*Percival, Bardsley, Brefeld, Spiritus, Kopp, Rust, &c.*) It may be given poured on coffee or lemon-juice, in the dose of one to three table-spoonfuls daily; or in the form of emulsion.

R.—Ol. jecinoris aselli,

Vini albi, āā ℥iv.

Gum. acac. ℥j. fiat emulsio, cui adde

Syrup cort. aurant. ℥j.—M.

Dose, two table-spoonfuls, two or three times a day, shaking the vial.

The author has never administered this oil, but a recent writer (*Mackintosh*) says, that he has; that he has seen it tried, and persevered in for some weeks at a time, without observing any benefit whatever from its use; and he adds:—"I can only wish a few

doses were exhibited to those gentlemen who have the patience to prescribe it for others."

The most useful agents—internal as well as external—belong to the class of revellents. Of these, certain diuretics, as the *oleum terebinthinæ*, have been chiefly used, especially in lumbago and sciatica.

R.—Ol. terebinth. gtt. x.
To be taken three times a day, in molasses.

Or, R.—Olei terebinth. rectific. $\bar{z}$ ss.
Pulv. gum. acaciæ,
Sacchar. alb. $\bar{a}\bar{a}$ $\bar{z}$ ij.
Aquæ menthæ, $\bar{z}$ iv.—M.
Dose, a table-spoonful, every two hours.

The cubebs have likewise been recommended.

R.—Pulv. cubeb. $\bar{z}$ ss.
Mellis q. s. ut fiat electuarium.
Dose, a teaspoonful, three or four times a day.

Or, R.—Ol. cubeb. gtt. x—xij.
To be taken three times a day, in syrup.

When the disease exhibits any evidences of periodicity, it may be met by the ordinary antiperiodics—as the sulphate of quinia and arsenic.

It is in chronic rheumatism, that we employ, with advantage, every form of external revulsion,—the linimentum ammoniæ, linimentum cantharidis, and the various excitant liniments of the pharmacopœias; leeches; cupping—dry and with the scarificator; moxa; counter-irritant lotions of ammonia; the ointment of tar-tarized antimony;¹ croton oil;² acupuncture, by which 30 out of 42 cases were cured in St. Thomas's Hospital, (*Elliotson*;) electropuncture; the magnet; galvanism; electricity; electromagnetism; the hot bath; the vapour bath; the sulphurous fume bath; chlorine fumigations, sinapisms, &c. &c.

¹ R.—Antim. tart. $\bar{z}$ j.
Adipis, $\bar{z}$ vij.—M.

² R.—Ol. tigllii, p. i.
— olivæ, p. ij.—M.

Hot springs—like those so called in Virginia—have effected cures, after every other remedy had failed; and the Russian vapour bath has been equally successful. Every hospital ought to be provided with an apparatus for fumigating, and for the application of steam; and it is not creditable to the members of the regular profession, that they have not used more extensively, in this and con-generous diseases, an agency so potent as that of "steaming," when judiciously employed.

Throughout the affection, the patient should be encased in flannel; and the use of the flesh-brush should be enjoined. Everything, indeed, that can diffuse the action over the surface, and thus produce an equalizing effect, is advantageous.

There are two forms of chronic rheumatism or neuralgia, according to some; of acute rheumatism, according to others (*Good*), which are worthy of a few observations. These are lumbago and sciatica; both of which affections do certainly assume, at times, almost all the characters of the acute disease; whilst at others, they are of long duration, and of less severity.

a. *Lumbago*.

SYNON. Arthrosia acuta lumborum, Lumbago rheumatica, Nephralgia rheumatica; Ger. Lendenschmerz, Lendenweh.

This is sometimes attended with very acute symptoms, although rarely with the same phenomena as acute articular rheumatism. The pain is deep-seated, and there is no redness or tumefaction of the lumbar region. The most excruciating suffering is induced by change of posture, and as all the efforts of the body are concentrated in the lumbar region, it is difficult to stir any part without adding to the pain.

b. *Sciatica*.

SYNON. Arthrosia acuta coxendicis, Ischias, I. rheumatica seu rheumaticum, Ischiadum Malum, Ischialgia, Ischias seu Sciatica nervosa, Neuralgia ischiadica, N. sciatica, N. femoro-poplitæa, Dolor ischiadicus nervosus, Coxalgia, (of some,) Morbus coxarius, (of some); Fr. Sciatique, Névralgie fémoro-poplitée; Ger. Huftweh, nervöse Hüftweh.

This affection—which was formerly classed with lumbago amongst the rheumatisms, and still is by many—like the latter may be acute, but it is more frequently chronic. It is characterized by excruciating pain in the region of the hip, which shoots generally along the sciatic nerve to the ham, and hence is decidedly neuralgic in its character.

A very common form of rheumatism affects the muscles of the neck, and is commonly termed a "*Crick in the neck*." It is a very painful affection, which causes the individual to hold his head to one side in a very characteristic manner. It is generally brought on by exposing the part to a draught of air, and, at times, by turning the head suddenly round.

Treatment of Lumbago and Sciatica.—Both the above affections are relieved by the general plan of treatment advised under chronic rheumatism. Great advantage is derived in the more acute attacks from cupping the parts freely, and repeating the operation again and again, should the symptoms suggest it. In sciatica, revellent diuretics—as turpentine—have been supposed by some to be more efficacious than in any other form of rheumatism. They may be given, however, advantageously in both. Acupuncturation, too, has been more used in these than in other localities, as well as strong counter-irritant lotions of ammonia.

Every form, however, of chronic rheumatism demands the same great general principles of management, with variations according to the judgment of the practitioner. The disease may attack any muscular structure, (see *Pleurodyne*,) and one form of counter-irritant may be more easily applied than another. It may be remarked, however, that those revellents, which act suddenly and powerfully on the part, often succeed in severe cases of deep-seated pain, after the ordinary revellents have entirely failed. Hence it is, that the moxa, ammoniated counter-irritants, the dropping

of water, as hot as it can be borne, on the part, have succeeded in many painful cases.

When the disease has been removed, great caution is needed to prevent a relapse; for it is very liable to recur. Woollen clothing next the skin; attention to diet, and avoiding all partial and irregular exposures, are measures that must not be neglected; and if they be attended to, it matters but little, whether heed be paid to the recommendation contained in the following paragraph. (*Mackintosh.*) "It is said that individuals previously liable to attacks of lumbago and sciatica have escaped further annoyance by wearing a piece of stick-sulphur in their breeches pockets, and it is well known, that the internal use of sulphur is a popular remedy for all forms of rheumatic complaints." So long as the wearing of this amulet does not prevent the adoption of other means of prophylaxis it is good and well: of itself it would scarcely appear to be capable of any energetic action.

Of late, cases have been published of the highly beneficial effects of the iodide of potassium, (*Liq. potassii iodid.* gtt. x, three times a day,) gradually augmenting the dose, and persevering with it for a considerable period. (*Graves, Connor, of Demopolis.*) Under its revellent action, lumbago and sciatica and other forms of rheumatism have yielded, which had resisted all other remedies.

For the removal of the "Crick in the neck," it is generally sufficient to employ anodyne frictions, or warm fomentations—covering the part with flannel.

R.—*Lin. saponis*, ℥iss.
Tinct. opii, ℥ss.—M.

It can rarely happen that leeches are needed. Covering the part with flannel, and passing a hot iron over it, sometimes affords instantaneous relief.

II. GOUT.

SYNON. Arthritis, Arthrosia podagra, Podalgia, Podagra, Arthritis podagra, Podagra arthritis; *Fr.* Goutte; *Ger.* Gicht, Gliedersucht, Gliederweh, Zipperlein.

Gout is a disease greatly resembling rheumatism; and, notwithstanding, differing from it in many essential particulars. In the joints, it appears to attack the same structures, and, like acute articular rheumatism—indeed more strongly than it—the inflammation shifts its seat frequently and rapidly, so that, in a few hours after a part has been greatly inflamed and tumefied, there may be no signs of the previous phlegmasia remaining; whilst another joint, not previously affected, may have assumed the inflammatory process. The reasons, consequently, which led to the inference, that acute rheumatism is a mixed neuropathic and inflammatory disease, apply still more forcibly to gout.

In the difficulty of comprehending the strange nature of gout, the wildest hypotheses have been entertained. It has been presumed, that certain secretions are transferred to the joints *gutta-tim*, as it were, and hence its name; which, although founded in

barbarous pathology, is now so universally received, that it would subject us to more inconvenience to remove, than there is evil in retaining, it.

In like manner, authors have differed much in regard to the observable varieties of gout: they may all, however, be conveniently considered, perhaps, under the heads of the *acute*, the *chronic*, the *retrocedent*, and the *rheumatic*.

1. *Acute Gout.*

SYNON. Arthritis acuta, Arthrosia podagra regularis, Podagra regularis; *Fr.* Goutte inflammatoire, G. articulaire, G. régulière, G. fixe; *Ger.* Ertliche Gelenkgicht, Acute Gelenkgicht.

It has been a common remark, that the gout, as it occurs in different persons, and even in the same person at different times, is a disease of such various appearance, that it is difficult to render the history of it complete and exact, or to give a character of it that will apply universally. (*Cullen, Turck.*)

This is true as regards chronic gout, as the author knows from unhappy experience; but it does not apply to what is termed a regular paroxysm or fit of the gout, which can scarcely be mistaken.

The prodromic or precursory signs of a paroxysm of gout are generally marked. Almost always, there is more or less disorder of the digestive function, with vague pains flying here and there; more or less drowsiness, vertigo, and palpitation or altered rhythm of the heart's actions. An indescribable restlessness is also experienced in many cases, which completely prevents the patient from sleeping. The signs, however, that precede the attack are exceedingly various: indeed, there is no disease, which is more Protean in its character.

It would be idle to attempt to enumerate all these. Commonly, they are referable to the gastro-intestinal function; but, at times, one of the first evidences of an approaching paroxysm may be exhibited in the urinary organs. In the author's own case, severe nephralgia induced by the passage of a small lithic acid deposition not uncommonly precedes the fit; and the moment this is relieved, the attack commences in the joint of the toe.

They, who have had one attack of gout, can generally prognosticate, with some degree of accuracy, from their feelings, that another approaches; but at times, and especially in the first fit, the immediate invasion of the disease is not preceded by any warning. (*Sir C. Scudamore.*) This has been doubted, and it has been affirmed, that the warning probably existed, but was not heeded, (*Mackintosh;*) but there is no doubt, that the paroxysm of acute gout may supervene very suddenly, and occasionally, very unexpectedly, in the midst of robust health; nay, it is affirmed by one writer (*Andral*), that almost always, on the evening before the attack, the patient has a better appetite, and unusual feelings of health.

After the precursory symptoms have existed for a longer or shorter period, or have not been observed, pain is experienced, generally in the phalango-metatarsal region of the great toe, but sometimes in other joints, especially the ankle, wrist, &c. The pain is said to take place more frequently in the night or early in the morning,—the patient being, at times, aroused from a tranquil sleep by its violence; but this scarcely accords with the results of the author's observation. The pain has generally, in the cases he has witnessed, been perceived before retiring to rest; and, like acute rheumatism, it is subject to marked aggravation in the course of the night. The pain is exceedingly severe, and has been properly compared to that which might be produced by the gnawing of an animal. The part throbs violently, and no ease can be obtained by any change of position:—at the same time, the part becomes intensely red, very tender to the touch, and, in the course of a few hours, is much swollen. These symptoms rarely reach their height before the expiration of thirty-six hours, after which the swelling begins gradually to decline, generally pits on pressure, and its subsidence is followed by desquamation of the cuticle.

Along with the appearance of the pain, symptoms of constitutional disturbance present themselves,—if they did not exist previously: or if they did, they now become more marked. Sometimes, chilliness is felt; and occasionally, for successive nights, severe rigors are experienced on first getting into bed. The skin subsequently becomes hot and dry; but generally, after these rigors, a profuse perspiration is established, which puts an end to the febrile exacerbation.

On the following night, the pain which had become more moderate during the day, is commonly greatly aggravated, so that it completely prevents all sleep; towards the morning, however, it generally becomes mitigated, a perspiration breaks out, and the patient sleeps. Every evening, for some days, the same kind of aggravation of the suffering recurs, but to a less and less degree; and, in the course of five or six days—sooner or later—it ceases altogether, and the paroxysm is at an end.

The urine, not only before, but also during, the paroxysm is at times scanty, and high coloured, and produces irritation in the bladder and heat in the urethra, with frequent desire to void it. A copious sediment of lithic acid or of the lithates is deposited; and, as the inflammatory symptoms subside, the urine loses these characters, and by degrees ceases to deposit the lateritious sediment, which previously fell from it; and in its place there is a whitish deposit, as if the urine were mixed with a small quantity of chalk or magnesia. (*Mackintosh.*)

Both before, and during an attack, the nervous system is evidently greatly deranged; and its impressibility is evinced by irritability of temper, intensity of pain, cramps, and the sudden translation of the disease from one joint to another.

After a paroxysm of gout has terminated, the individual is by

no means left in a state of health in all cases. There may, indeed, be a succession of paroxysms for weeks before the disease finally yields. Generally, however, the patient remains in a state of imperfect health, with a persistence of those signs, that have already been described as prodromic, and more or less pain and lameness, either in the joints of the toes, or of the ankle, knee, elbow, wrist or fingers. This gradually passes away, and if he be placed under favourable circumstances, he may be speedily restored. Occasionally, the gouty valetudinarian flatters himself, that the paroxysm has improved his health; and where the disease has been preceded by protracted dyspepsia and its congenerous phenomena, the patient does often feel himself better, and more vigorous, than he may have done for weeks or months previously.

At first, the attacks of gout rarely recur except at long periods,—one or two years or even longer, for example; but the intervals between the subsequent paroxysms usually become shorter and shorter, until, ultimately, life may be rendered almost insupportable. The paroxysms themselves, too, generally become more and more protracted.

2. Chronic Gout.

SYNON. Arthritis chronica, Arthrosia Podagra larvata, Podagra atonica, P. irregularis, Disguised, lurking, atonic gout; *Fr.* Goutte irregulière, G. asthénique, G. consécutive; *Ger.* Chronische, desorganisirende, zerstörende Gelenkgicht.

By chronic gout is meant that condition, in which the patient may be left after repeated attacks of the acute form; or a similar catenation of phenomena may exist where no acute attack has been experienced. The joints are liable, alternately, to stiffness and lameness; and the phlegmasia is never very active; but the functions of the body generally are apt to be greatly disordered; and the temper becomes irritable, so that, as was remarked by a distinguished writer—himself a sufferer—every paroxysm may be as justly denominated a fit of anger as a fit of the gout. To this result, however, there are numerous exceptions. Some individuals, of buoyant dispositions, remain unruffled, and only lose their equanimity during the violence of a paroxysm, and not even then.

If the prodromic symptoms of acute gout were protean, the remark applies with still more force to the concomitant phenomena in chronic gout. Indeed, every uneasy feeling under which a patient may labour, who has had a decided attack or attacks of gout, or who considers that he is entitled to it, is apt to be ascribed to this *vice* in his constitution. Disorders of every kind of the digestive functions prevail; the rest is disturbed, without any assignable cause; the heart's action is irregular; sometimes violent palpitations are felt, and pulsations in the course of the abdominal aorta; at other times, the pulse loses a beat; and the intermission is indicated by an indescribable feeling in the epigastric region, which partially incites to cough; anomalous pains and uneasiness may exist in the

rectum, which have been ascribed, in many cases, to an enlarged and painful condition of the hemorrhoidal veins: these occasionally discharge blood in considerable quantity. The urine generally deposits the lithates or the lithic acid, and when the health suffers, phosphatic depositions not unfrequently take place. Chronic cough and expectoration sometimes exist, which are dependent upon a hyperæmic condition of the bronchial mucous membrane. (*Mackintosh*.) Almost always, the encephalic functions suffer more or less; and, in addition to the common deterioration of temper, more or less giddiness, sometimes to such a degree as to endanger falling, with depravations of vision, as *muscæ volitantes*, accompany the dyspeptic, and often hypochondriacal, symptoms.

In such a state, it is obvious that more danger arises from the supervention of structural derangement in some important internal organ. Acute gout seizes hold of one or more articulations, is excessively painful, but runs its course in a few days. Chronic gout, on the other hand, has no definite duration, and although the suffering in equal periods is much less in the chronic than in the acute form, it is extended over a much longer time, and flies from joint to joint, or from a joint to some internal organ, constituting the *Arthritis vaga*, *A. erratica*; Fr. *Goutte vague*; Ger. *Wandernde, herumziehende Gicht*, of writers.

Repeated attacks of acute—and still more, perhaps, of chronic—gout give rise to structural changes about the joints; so that pain, tumefaction, weakness, deformity, distortion and ankylosis, may be the ultimate result. The author has seen some distressing cases of this kind, in which the individuals have been crippled in most of the joints; and those of the hands and feet have been rendered wholly useless.

In a few cases, and in persons of particular gouty idiosyncrasy, (*Sir C. Scudamore*), small tumours form, especially around the smaller joints, which are at first soft and tender to the touch, but soon lose these qualities, and become calcareous or tophaceous depositions. These depositions, in rare cases, give occasion to ulceration, and to fistulous openings, through which they are discharged. They are termed, in common parlance, “chalkstones,”—in technical language, *Tophi*, *Tubercula arthritica*; Fr. *Nœuds*; Ger. *Gichtknoten*; and the form of gout, in which they are seen, is sometimes distinguished by the names, *Arthritis nodosa*; Fr. *Goutte noueuse*. These concretions consist chiefly of lithic acid and soda, (*Wollaston*), or of lithate of soda and phosphate of lime. (*Barruel*.) They are found in various situations, from within the synovial membrane of the joint to the layers of the cutis. (*Sir C. Scudamore*.) “I have found them,”—says the writer just cited—“in the living subject, filling the bursæ, and condensed to great hardness; in the sheaths of tendons, feeling almost stony; in the cellular membrane, either in hard or soft lumps; and under the cuticle, pressing for escape. In one gouty person, who comes under my frequent observation, the concretions near the surface have

caused numerous ulcerations both in the hands and feet, and the chalk-like matter is constantly secreted."

Some years ago, the author saw a distressing case of this form of gout. The chalk-stones had formed at the expense of the fingers, and escaped, until, ultimately, the nails appeared as if projecting from the metatarsal bones.

3. *Retrocedent Gout.*

SYNON. Arthritis retrograda, A. retropulsa, Arthrosia podagra complicata, Podagra complicata, P. retrograda, P. aberrans, Metastasis arthritica, Retrograde, recedent, misplaced Gout; *Fr.* Goutte malplacée, G. larvée; *Ger.* Zuruckgetretene Gicht, Gichtmetastase.

In gout, as in acute rheumatism, it occasionally happens, that the inflammation appears to recede suddenly, or to become materially relieved, and symptoms present themselves, which lead to the conclusion, that the gout has attacked some internal organ. The patient may be affected with stupor, coma, or with delirium, intense cephalalgia, &c. leading to the suspicion of apoplexy or encephalitis; or unequivocal indications may present themselves of pulmonary or cardiac inflammation, or of gastritis, hepatitis, enteritis of the peritoneal or of the mucous coat, or peritonitis proper; or of inflammation of the urinary bladder.

A recent writer, (*Sir C. Scudamore*), thinks the transference is most disposed to affect the stomach or intestines, or both in succession; the symptoms being exquisite pain and spasm, with vomiting. "If the intestines be more distinctly affected, enteritis, in its worst form, is produced, and vomiting, which is a usual attendant, is more or less urgent, according as the seat of disease is near or distant from the stomach. In either case, the danger is pressing, and unless relief be speedily rendered, death soon closes the scene."

Although we constantly hear of persons dying of gout in the stomach, gout in the head, &c., it must be admitted, with a recent writer, (*Mackintosh*), that unless from some rash practice, as exposure to wet and cold, whilst labouring under a paroxysm, or from some imprudence on the part of the patient, such sudden translations of the inflammation, during the paroxysm of gout, are amongst the rarest occurrences to be met with in practice, unless, indeed, there has been previous disease in the organ to which the translation takes place. In such case, too, it may be a question, whether the mischief in the internal organ is in reality arthritic; or whether, in the highly impressible state of the system that exists during a paroxysm of gout, disturbing influences may not have induced ordinary phlegmasia in an organ predisposed, at the time, to assume it. Certain it is, that it is proper for the practitioner so to regard it, and to treat the intercurrent phlegmasia as if it were primary, and dependent upon ordinary causes. This is the plan, already advised in acute rheumatism, and in the changeable phlegmasiæ that have fallen under consideration.

4. *Rheumatic Gout.*

SYNON. Arthritis rheumatica.

An apparent combination of gout and rheumatism exists at times, to which, when the gout appears to predominate, the name *Rheumatic gout* has been given; when rheumatism, the name *Rheumatalgia arthritica*. At this time, the author has under his care a poor female, the joints of whose fingers are swollen and painful; the affection remaining for a time in one hand, and then leaving it and attacking the other; but the evidences of previous disease—as tumefaction, difficulty of moving the joints, and evident morbid deposition still remain. Now, if this affection had occurred in one who had been subject to attacks of gout, it would have been ascribed to that disease, and to the chronic form. It is owing, indeed, to the difficulty in deciding, in such cases, whether the disease belongs to the one or to the other, or to a combination of both, that the division of rheumatic gout has been established.

The following table of the diagnosis between acute rheumatism and acute gout (*M. Hall*) is, in the main, accurate.

<i>Rheumatism</i>	<i>Gout</i>
1. occurs in the young, even the very young and the robust.	1. occurs in the middle aged, the old, the dyspeptic, &c.
2. is induced by <i>external</i> causes, principally by exposure to damp and cold.	2. is induced by <i>internal</i> or constitutional causes, and especially by profusion in diet and wine.
3. affects many of the larger joints, and the muscles.	3. usually affects one of the smaller joints only, especially the ball of the great toe.
4. induces intense redness, tenderness and torture, even without motion.	4. induces but slight redness or tenderness, and pain, principally or only felt on moving.
5. <i>may</i> suppurate.	5. rarely or never suppurates, but forms deposits of urate of soda and phosphate of lime.
6. is attended by profuse <i>acid perspirations</i> .	6. is attended by <i>urinary</i> deposits of the <i>lithic acid</i> or the <i>lithates</i> .
7. is particularly liable to induce organic disease of the <i>heart</i> .	7. is apt to induce <i>functional</i> disturbance of the <i>head</i> , of the <i>stomach</i> , &c.
8. is attended by great <i>tolerance of loss of blood</i> .	8. is attended by <i>impatience of loss of blood</i> .

The alternation or coexistence of gout and gravel is one of the most marked circumstances attending these affections, and strikingly exhibits their congenerous character; this, indeed, is shown by the tophaceous concretions of gout, which, as already remarked, contain, in all cases, the *lithic* or *uric acid*.

Causes of gout.—There can be but little doubt, that the disease hereditary,—that is, in the first admixture of the materials furnished at a fecundating union, an impulse exists to an organization, which favours the development of gout at a certain period of life, under the action of adequate exciting influences,—in

other words, that a predisposition to the disease is laid in organization. The observation of some individuals has satisfied them, however, that the disease is more frequently acquired than hereditary. (*Mackintosh.*) Of one hundred and thirteen patients, in whom the disease was hereditary, 32 acquired the predisposition from the father; 9 from the mother; and 3 from the father and mother; in 6, the grandfather only had gout, the disease entirely skipping over one generation; in 1, the grandmother only; in 3, the uncle only; in 1, the aunt only; and in 58 cases, the gout was not known either on the father's or mother's side. (*Sir C. Scudamore.*)

There can be no doubt, that the disease is often said to be hereditary when it is acquired, as there are many, who are unwilling to admit, that their habits are of such a character as to engender it. On the other hand, there are also many who are proud to have it supposed, that their ancestors were liable to it. "What is a consolation to me," observed a distinguished medical writer, (*Sydenham,*) "and may be so to other *gouty* persons of small fortunes and slender abilities, is, that kings, princes, generals, admirals, philosophers and several other great men, have thus lived and died. In short, it may in a more special manner be affirmed of this disease, that it destroys more rich than poor persons, and more wise men than fools."

These very facts, and one of an analogous character, that gout is rarely seen in hospital practice, show, that there are circumstances, connected with the regimen of the rich, that must predispose to gout: these probably consist in too great indulgence in nutritious aliment and wine, associated with insufficient exercise. The habit of taking great variety of food, and that food consisting of rich made dishes, lays the foundation of ordinary dyspepsia; and when, along with this, port wine or Madeira is taken freely and habitually, a condition of the system may be induced, which constitutes the gouty diathesis.

A recent intelligent writer (*W. Budd*) is disposed to think—and the observation of the author leads him to the same belief—that malt liquors tend, even more than wine, to produce a gouty diathesis, and the evidence, which he adduces on this subject is striking. "There is a body of men employed on the Thames, whose occupation it is to raise ballast from the bottom of the river. As this can be done only when the tide is ebbing, their hours of labour are regulated by that circumstance, and vary through every period of night and day. They work under great exposure to inclemencies of weather; their occupation requires great bodily exertion, occasioning profuse sweating and much exhaustion. In consideration of this, their allowance of liquor is very large; each man drinks from two to three gallons of porter daily, and generally a considerable quantity of spirit besides. This immoderate consumption of liquors forms the only exception, as far as relates to food, which these men offer to the general habits of the lower classes in London. Gout

is remarkably frequent among them, and although not a numerous body, many of them are every year admitted to the Seamen's Hospital Ship affected with that disease. This is a very interesting fact, and seems to show, that no amount of bodily exertion is adequate to counteract the influence of large doses of porter; the exposure of ballasters to wet and changes of temperature probably favours its operation. These men are almost all derived from the peasantry of Ireland; they can rarely, therefore, inherit a disposition to gout."

Age, unquestionably, has an influence on the development of this diathesis. It is extremely rare before the period of puberty; although cases do occur. A writer of large experience in this disease (*Sir C. Scudamore*) asserts, that he has not witnessed more than one example of a first attack before 20; nor any after 65.

It is much more uncommon amongst females than males, but it occasionally presents itself severely in the former. The cause of their greater immunity probably resides in their being less exposed to the ordinary exciting causes. The idea, that it is "doubtless ascribable in part to their menstrual evacuations," (*Andral*,) would seem to be hypothetical.

As to the over-exertion of the brain in literary labours being a cause of gout, all the author's experience has been in the negative. It is not over-action of the brain that is injurious, but the ordinary concomitants—as irregularity in regard to meals, want of exercise, sitting up late at night, &c. &c. Where a person is predisposed to attacks of gout, excessive fatigue or reduction of any kind is a common cause of a paroxysm; hence, it follows long watching, great anxiety, &c.; excessive discharges; and a great mistake if often committed by the gouty, in keeping the system too low; whilst it must be admitted, that the opposite extreme is more frequently to be deprecated. Where the predisposition to gout is very strong, disorder of the stomach, especially that induced by a debauch, and still more if that debauch have been in particular varieties of wine, will act as an exciting cause. The condition of the toe in a regular paroxysm is but an incident—an expression: the mischief is in the system, but still it would seem, that the pressure of a tight shoe sometimes develops an attack. (*Mackintosh*.) Such has appeared to be the case, in one or two instances, in the author's own person.

Pathological characters.—These can scarcely be said to exist. If the person dies from an affection in some internal organ, the pathological appearances will vary according to the precise character of the affection; but those appearances cannot be characterized as gouty. The parts themselves, which have been really labouring under gout—the articulations—may present no appearances whatever of arthritis; and even in cases of the arthritis nodosa, there may be merely evidences of the presence of the tophaceous concretions. The sudden disappearance of all evidences of inflammation

has led some to the belief, that whilst rheumatism is an affection of *tissues*, and, although peculiar, still *inflammatory*,—arthritis is an affection of *functions*, and more allied to *irritation* than inflammation. (*M. Hall.*) It is difficult, however, to separate these two affections by such broad lines of demarcation. The reasoning that applies to one, applies, indeed, equally to the other. The former we have considered essentially neuropathic in the first instance, and subsequently inflammatory; and the latter must be esteemed the same. A modern writer thinks a diseased state of the stomach and bowels, as produced by the various causes above mentioned, either singly or combined, in addition to a plethoric state of the system, is the cause of the gouty paroxysm, and he regards gout simply as an inflammation of the affected part, produced by an effort of the constitution to remove disease from the internal parts to the surface of the body. “Therefore, the inflammation of the toe is not to be regarded as a disease, but only as the occasional symptom of a disease, which may be one either of function or of structure. (*Mackintosh.*)

Lastly, the disease has been conceived to consist of two elements,—the one inflammatory, and seated in the fibrous tissue; the other more general, and seated in the blood, which is modified in its character by the presence of uric acid, deposited around the articulations. (*Andral.*)

The *vice*, certainly, in these cases, appears to be seated in the whole system of nutrition. Whether the blood be modified or not, the nutritive exhalents of the affected part take upon themselves an unwonted action, and, in chronic cases, secrete from the blood concretions of very different elements from those that enter into the composition of the bones. An attention, indeed, to the functional phenomena during a paroxysm of gout, as well as throughout the whole course of chronic gout, exhibits, that the functions of circulation, innervation, and secretion, are all more or less concerned; and in chronic gout especially, those remedies, which act as revelents on the whole frame, are found of the greatest benefit.

Treatment.—It is the opinion of some practitioners—now few, however—that a paroxysm of gout is an effort of nature to rid the system of something noxious, and that, consequently, it is not advisable to interfere with it. It was indeed laid down by an eminent authority, (*Cullen,*) that patience and flannel are alone necessary. It is unquestionable, that, under ordinary care, a paroxysm of gout passes off safely; that but few remedies are indispensable; few, indeed, of any advantage; and that even in acute gout, the important period for treatment is after the paroxysm has passed away.

A common notion prevails, that gout wards off other diseases, and clears the system of mischiefs within it. This is very questionable. An attack of gout is usually preceded by much general indisposition, and after the attack the person usually suffers less, but it is doubtful whether the paroxysm is ever salutary, or removes

existing evils. The evidence appears, at least, to the author, to be insufficient to establish the position.

It must be borne in mind in the management, that gout is a peculiar disease, requires the presence of a special diathesis, and that the inflammation is primarily neuropathic. The arguments, indeed, which were adduced to show that rheumatism is neuropathic—as already remarked—apply *à fortiori* to gout. Bleeding, therefore, from the general system, can be rarely advisable, except in robust habits, and then it must be practised early, and not be pushed to any great extent, as experience has shown, that loss of blood is not borne well in gout: it is affirmed, indeed, that in thin and “non-plethoric” subjects, (*Andral*,) bleeding has been speedily followed by death.

In an ordinary mild attack of acute gout, the patient should be kept entirely quiet, the bowels be opened by some gentle laxative, and as there is always, probably, a predominance of the lithic diathesis, the best laxative perhaps is magnesia combined or not with rhubarb:¹ the diet should be restricted, and consist of farinaceous substances, as arrow-root, sago, tapioca, &c.

¹ R.—Pulv. rhei, gr. x.
Magnes. gr. xv.
Ol. carui, gtt. iij.—M.

To the affected part, in mild cases, the author makes no application, except covering it with flannel; but some practitioners advise tepid evaporating lotions of camphor.

R.—Tinct. camph. ℥iij—℥iv. Or, R.—Alcohol. p. j.
Aquæ, Oj.—M. Mist. camphor. p. iij.—M.

These may be applied to the part by means of linen rags several times folded, and kept constantly wetted. (*Mackintosh*.) The last lotion is said to be much used, and with the best success, applied at a temperature of from 75° to 85°. Of late, the colchicum¹ has been used with the same view, (*Wansbrough*;) and it has been affirmed, that the local use of morphia had the same effect,—the part being bathed in hot water for a minute, and then lint applied, spread with simple cerate, on which about three grains of acetate of morphia were distributed.

¹ R.—Tinct. sem. colchic. ℥ij.
Alcohol, ℥j.
Aquæ, ℥iij.—M.

If the local inflammation be very violent, leeches would seem to be indicated, and they are, doubtless, of service in certain cases. Still, the author does not find it necessary to apply them frequently; and when it is recollected, that the disease is constitutional, and that the local inflammation is only a symptom, it cannot often be necessary to attack actively the articular inflammation. Soaking the foot in warm water has afforded relief, and some bold practitioners are in the habit of applying cold water, and even ice to the

affected part. This last was a practice strongly recommended many years ago, (*Kinglake*,) but is not much in vogue now, owing to the apprehensions—perhaps groundless—that there must be danger of repelling the phlegmasia from the extremity towards some internal organ.

Where the pain is very severe, opiates may be given freely: small doses in such cases irritate, whilst sedative doses afford marked relief.

Many years ago, a celebrated gout remedy—*Eau médicinale d'Husson*, was brought forward in France as a specific against gout, and was largely used by many gentlemen of scientific and other distinction. So high, indeed, was its reputation, that great efforts were industriously made to discover its active ingredient. At one time, this was presumed to be the veratrum album; but, subsequently, it was shown, (*Want*,) to the satisfaction of scientific individuals, that the colchicum is the basis, and that it is the hermodactyl, recommended by Trallian in arthritis. (*Sir Joseph Banks, Sir Gilbert Blane, Sir Henry Hallford*.)

This *Eau médicinale* was presumed to consist of two ounces of the colchicum root macerated in eight ounces of sherry wine, the dose being from 20 to 80 drops. The author has often exhibited the different preparations of colchicum in gout, and frequently with decided advantage; but very often it has failed altogether. In his own person, it has never appeared to prevent or to modify the paroxysm. (See the author's *New Remedies*, 3d edit. p. 159: Philad. 1841.) It was owing, however, to the reputation of the *Eau médicinale*, and to the favourable testimony in regard to the colchicum from distinguished sources, that many new preparations of it were received into the British and other pharmacopœias. The wine of the root, (℥xv to ʒjss,) and of the seeds (f. ʒj to f. ʒij) is given at times, at the commencement of the paroxysm; and when it has set in, ten or fifteen drops of either of the wines may be given every four or five hours. The colchicum is sometimes, also, associated—for purposes already mentioned—with magnesia and its sulphate.

R.—Magnes. sulphat. ʒj—ʒij; solve in
Aquæ Menthæ, ʒx; adde
Acet. colchic. ʒj—ʒiss.
Syrup croci. ʒj.
Magnes. ʒviii.—M.

Three tablespoonfuls to be given, so that from four to six evacuations may be produced in 24 hours. This is sometimes called "Scudamore's mixture."

The various preparations of colchicum, referred to under the head of acute rheumatism, have been employed by different practitioners,—some preferring one, others another. A recent writer (*Mackintosh*) remarks, that he has used all the preparations, but finds a saturated infusion of the seeds in wine to answer better than any other; exhibited, according to the age and constitution, in doses of from 20 to 120 drops, conjoined either with the same quantity of tincture of hyoscyamus, or with a half or even a third part of the

sedative solution of opium, which he finds to answer better than laudanum. In gout, it probably acts on the system in the same manner as in acute rheumatism.

An idea has existed, that the constant use of the colchicum may render the recurrence of the paroxysm more frequent, but there does not appear to be any sufficient reason for this opinion. (*Sir H. Halford, H. Holland.*)

In rheumatic gout, when given in the dose of eight grains every hour, until "active vomiting, profuse purging, or abundant perspiration takes place, or at least until the stomach can bear no more"—it is affirmed by a late writer, (*Wigan,*) to be "the most easily managed, the most universally applicable, the safest and the most certain specific[?] in the whole compass of our opulent pharmacopœia."

The aconitia, delphinia, and veratria, have been prescribed as in acute rheumatism, but they are rarely used.

It has been already remarked, that a predominance of acidity exists during the arthritic paroxysm, for which laxatives of magnesia or rhubarb and magnesia are serviceable. It may be, also, advisable to administer, in addition, the bicarbonate of soda, a scruple of which may be prescribed in simple water, or in soda water, twice or thrice a day. In France, it is customary, in such cases, to give the Eau de Vichy, which is an alkaline water, and therefore appropriate.

In chronic gout, the same plan of treatment has to be adopted; subject, however, to modifications according to the functional phenomena that are predominant. It may be necessary to apply leeches, but more sparingly than in the acute form; and when the pain becomes fixed in any of the joints, the same revellent agents may be needed as were advised for chronic rheumatism. The part, too, may be covered with oiled silk or flannel. It is in such cases, that a combination of bitters and alkalies or alkaline earths is given with advantage, to correct the lithic acid diathesis, and to give tone to the stomach, which is often greatly impaired.

Where tophaceous concretions have formed in the joints, there is no better remedy than iodine, (*Jahn,*) which may be given either in the form of the tincture, (*Tinct. iodin. gtt. x, ter die ex syrupo,*) or of Lugol's solution.

R.—Iodin. ℥j

Potassii iodid. ℥ij.

Aq. destillat. ℥vij.—M.

Dose, ten drops, three times a day, in sugared water.

In a case of goître complicated with gout, the iodine was given, which succeeded in dispersing the goître; and, at the same time, the tumefaction of the joints, and the depositions gradually disappeared. (*Valentin.*) Adopting this hint, Valentin gave the iodine in several cases of gout, with the effect of mitigating the disease, and, at times, of completely curing it. In gouty swellings of the

bones, a plaster of ioduretted iodide of potassium has been found efficacious. (*Ebers.*)

R.—Iodid. potass.

Iodid. āā ʒss—ʒj.

Emplastr. hydrargyri seu saponis, ʒij. fiat emplastrum.

When the gout is retrocedent, and attacks an internal organ, the treatment must vary according to the nature of the induced affection. If inflammatory, it may have to be met by antiphlogistics; more commonly, however, when it attacks the stomach, the remedies appropriate for cramp of the stomach are indicated. (See *Gastrodynia*.) It has been advised, that attempts should be made by hot stimulating pediluvia or sinapisms or both to recall the gouty inflammation to the extremities; but, as in other “changeable phlegmasiæ,” these attempts will probably fail: still their revellent operation may be salutary. They certainly ought not to preclude the vigorous adoption of measures directed to the suffering organ.

In regard to the regimen, that ought to be used by those who are subject to attacks of gout, much must be left to the judgment of the practitioner, as respects the constitution and habits of the patient. Nothing is more clear, than that there can be no plan, which is equally applicable to all. If one element in the causation of the disease be, “the supply of nutritive materials in greater quantity than the process of decomposition can remove them,” (*Andral*,) it is obviously important to diminish this supply. With this view, in the generality of cases certainly, it is of moment, that the amount of nutritive aliment should be restricted within proper limits; these limits being regulated, however, in some measure, by the previous habits of the patient. If a person has been accustomed to full living, and to a certain allowance of generous wine, it can never be proper to withhold these altogether. There are many persons who experience an attack of gout whenever their amount of stimulating diet is largely reduced, and who retain their health, provided it is allowed in moderation; and it has been already remarked, that depressing influences of all kinds are common excitant causes.

In regard to the precise diet, the remarks that have been made under *Dyspepsia*, are equally applicable here. Whatever disorders the stomach may lay the foundation of a gouty paroxym, and hence all aliments, which disagree by their quantity or quality, must be carefully avoided. Impropriety in eating may be almost as injurious as impropriety in drinking. As respects wines, much depends upon the habits of the patient. Port wine is proverbially gouty, and so is Madeira. Champagne is usually placed in the same category; but the author has found, that, with some, much depends upon the quantity taken. A single glass of champagne may disagree,—the quantity of stimulus in it not being sufficient to compensate for the injurious effects of the free saccharine matter in solution; but a pint of the same wine may be taken with impunity. Such has been the author’s experience in his own case,

as well as in that of several of his patients and friends. The lighter wines of France, of the Rhine and the Moselle are drunk freely by the inhabitants of the countries in which they are made, and they certainly are not as liable to gout as where the stronger wines are taken. Of these stronger wines, the least objectionable, perhaps, is sherry, which may be taken in moderation by the valetudinarian who has been accustomed to his glass of wine after dinner; but if any stimulus be needed, a little weak brandy and water is, perhaps, preferable.

Regular exercise on foot, short of inducing fatigue, attention to the condition of the digestive function, and travelling air and exercise,—the adoption, indeed, of all the recommendations given under the head of Dyspepsia,—should be inculcated. In chronic gout, succeeding a severe attack of acute gout in the author's own person, he determined to see whether the morbid catenation could be broken in upon by a thorough change of all the influences surrounding him. With this view, he left the city (Philadelphia) with a friend, travelled to Boston, and crossed the country to Albany; returned home at the end of a fortnight perfectly restored, and remained free from any regular paroxysm of the disease for upwards of three years.

CHAPTER II.

CACHEXIÆ.

SYNON. Dysthetica, Dyscrasiæ, Cacochymia.

THE word cachexia, which literally means “bad habit,” has received numerous acceptations in the history of medicine, and has been made to comprise various diseases, which are now more generally separated from it. One of the latest nosologists (*Good*) defines “cachexies” to consist in a—“morbid state of the blood or blood-vessels, alone or connected with a morbid state of the fluids, producing a diseased habit;” and, under this head, he ranges Plethora, Hæmorrhagia, Marasmus, Cyrtosis, Alphosis, Struma, Carcinus, Lues, Elephantiasis, Bucnemia, Catacausis, Porphyræ, Exangia, Gangræna and Ulcus. Another (*Hecker*), enumerates the following species—Cachexia abdominalis seu gastrica, Cachexia arthritica, C. incerta, C. leprosa, C. mercurialis, C. rachitica, C. rheumatica, C. scorbutica, C. scrophulosa, C. syphilitica seu venerea, and C. syphiloidea.

The acceptation, in which cachexia is employed here, includes chronic affections, induced by some *vice* in the system of nutrition, whether this vice be dependent upon a morbid condition of the circulating fluid which furnishes the pabulum whence the

tissues are formed, of the vessels of nutrition themselves, or of both combined.

Some of the morbid conditions, that belong to this division, and affect especially particular organs of the economy, have been described elsewhere—for example, the splenic cachexia, the state of anæmia, and many chronic cutaneous affections, in all of which the character of the fluids, or the condition of the function of nutrition, or of both is modified; but there are still others, which may be conveniently considered under this head, and which, although primarily affecting particular portions of the frame, implicate, sooner or later, various organs.

It is obvious, that in order for the tissues to be normally nourished, the blood must be possessed of the proper qualities; and that should it fail in these essentials, and impress the parts, which it bathes, abnormally, faulty nutrition must be the consequence. In like manner, if the blood be healthy, and the organs that are concerned in nutrition be morbidly impressed, disease must result; hence it is, that hypertrophy and atrophy may be induced; in which there may be simply an increase of the nutritive action in one case, and a diminution of it in another;—or, the nutritive action may, under certain circumstances, become so much perverted, that substances may be separated from the blood that have nothing analogous to them in the economy. These last are cases, which, by all, are considered to belong to the cachexiæ; under some vice in the system, the nutrition of the tissues is so much interfered with as to give occasion to various heteroclite or heterologous formations.

In other cases, again, the altered condition of the blood gives rise to a train of phenomena indicating that it contains a paucity of fibrine and red globules; it is, therefore, imperfectly adapted for the nutrition of the tissues, whose tone or cohesion, is consequently diminished, as indicated by the general appearance of the patient and by an asthenic condition of all the functions; and, in other cases, again, the depravation of nutrition may be indicated by morbid appearances of the cutaneous envelope, or by chronic cutaneous diseases, which may demand a system of management—as elsewhere remarked—calculated to produce a thorough change or revulsion in the morbid tissues.

In regard to those diseases of nutrition, that are dependent upon some morbid influence or *vice*,—as scrophula, cancer, and syphilis, the principles of treatment, it will be found, are much alike. The only method, by which the system can be dispossessed of the morbid influence, is by inducing a new condition, which is incompatible with its existence. Hence recourse is had to those valuable revellents, more especially, which are the gifts of modern chemistry.

I. SCROPHULOUS CACHEXIA.

SYNON. Scrophulosis, Scrophula, Scrophulæ, Morbus scrophulosus, Vitium scrophulosum, Cachexia scrophulosa, Dyscrasia scrophulosa, Pædatrophia glandulosa, Tabes glandularis, Struma, King's Evil, The Evil; *Fr.* Scrophules, Ecouelles; *Ger.* Scrophelübel, Scrophelkrankheit, Scrophelsucht.

It has been properly remarked, that in the varied catalogue of morbid affections to which man is liable, there is scarcely one of such paramount importance, of such engrossing interest, as scrophula,—whether we look to the obscurity of its origin, its insidious progress, the number and variety of the organs which it attacks, or its remarkable intractability and extensive fatality. (*Stokes.*)

The definitions usually given of the disease, express but very imperfectly its great characteristics. Thus, a modern nosologist (*Good*) gives the following,—“Indolent glandular tumours, chiefly in the neck; suppurating slowly and imperfectly, and healing with difficulty; upper lip thickened; skin smooth; countenance usually florid.”

The chief phenomena of scrophula, and such as are characteristic, are, certainly, swelling and suppuration of the lymphatic glands, but many other affections have been properly regarded as the effect of the scrophulous cachexia or diathesis,—such, for example, as white swelling, caries of the vertebra, enlargement of the mesenteric ganglions, &c.; whilst others, both in the domain of medicine and surgery, have been ascribed to some scrophulous *vice*, on grounds that are, perhaps, less satisfactory.

One great stumbling-block in the way of the investigation of scrophulosis is the confusion that has prevailed in regard to what was understood by the term,—some restricting it altogether to glandular enlargement, as of the glands of the neck, without much, if any, reference to a peculiar constitutional diathesis; others applying it, with more propriety, to the condition of the economy, of which the local affection may be esteemed a symptom—a mere expression; whilst a third class, affix the epithet “scrophulous” or “strumous” to a number of very opposite diseases, which have no character in common, save incurability and chronicity, (*Stokes*;) and, it may be added, the term is not unfrequently used to conceal professional ignorance, when the practitioner “is puzzled and foiled in the treatment of disease.” (*Mackintosh.*)

Diagnosis.—As in the case of tuberculosis, and the various other cachexiæ, there is, unquestionably, a diathesis, without the existence of which scrophula would not be indicated by the symptoms that are considered to characterize it. “They,” says a recent writer, (*Dubois d’Amiens*), “who see in the scrophulous cachexia merely a subinflammatory engorgement of the lymphatic ganglions, or the development of subcutaneous tubercles, have only described a part of the symptoms of the disease: their symptomatology is necessarily truncated. We who, on the contrary, class the scrophulous disease amongst the cachexiæ, and who consider it as the result of nutritive

aberration, (*nutrition anormale*,) must include *all* the symptoms, without exception, of whatever apparatus, organ or tissue may be affected in the economy,—and there is none which may not be, as the whole economy is subjected to the acts of composition and decomposition; in other words, to assimilation and elimination.”

It is difficult to describe the characteristics of the scrophulous diathesis; for, although it is generally laid down, that a fair complexion and light hair and eyes are indicative of it, it is unquestionable, that the evidences of scrophula appear as frequently in those of the opposite, indeed of every variety of, complexion.

Amongst the whites of this continent, scrophula is certainly not as common as in England; but of the cases that do occur, the author's experience favours the inference, that it is seen at least as frequently in those of dark hair and swarthy skins. It is a very common affection, too, amongst the negroes, in the southern states, and in them is often seen in its most aggravated forms.

At times, the child—for the evidences are most commonly presented in childhood—exhibits appearances that leave but little doubt of his scrophulous constitution. The paleness of the skin; its transparency, as it were, and delicacy; the large size of the head, and prominence of the abdomen; the development of the articulations, and smallness of the muscles,—all indicate a defective formation, which—as will be seen—has been esteemed to characterize scrophula. Yet these evidences are often absent, when the scrophulous diathesis, notwithstanding, exists; and the glandular affections—as has been remarked above—may coexist with an opposite character of hair and surface.

It need scarcely be said, that simple tumefaction of the glands of the neck is no more strumous than the same condition of the lymphatic ganglions in other parts of the body. We know, indeed, that they inflame in healthy constitutions under irritation. For example, in children, eruptions on the head and face not unfrequently cause inflammation, and, at times, suppuration of the lymphatic ganglions of the neck, in the same manner as any injury of the extremities induces swelling and inflammation of the lymphatic ganglions of the axilla or groin; and irritations in the mucous coat of the intestines cause inflammation of the mesenteric ganglions.

The symptoms, which are usually considered to indicate the presence of scrophula, are the following:—slight inflammation of the *alæ nasi*, which are red, hot, and chapped. The cervical glands enlarge, being at first small, and slightly sensible to the touch; but, subsequently, they are hard, irregular on the surface, and indolent. In this stage, they are movable under the skin. Gradually, however, they increase in size; become immovable, painful, and, occasionally, by their pressure interfere with the subjacent organs, so as to affect the voice, respiration and deglutition. The colour of the skin is scarcely changed, but, at each side of the neck, the projection is, at times, so great as to constitute considerable deformity, and to interfere with the movements of the head, and

even with the separation of the jaws. After having remained in an indolent state for an uncertain period, the tumours may gradually disappear. Such, at least, is usually the case, where they occur in adolescence, and it is the most favourable termination; but in childhood especially, they more frequently proceed to suppuration, soften, are painful, and fluctuation is perceptible; the skin, covering them, becomes red and bluish, and ultimately opens, giving issue to a puriform fluid, which is usually of a thinner kind than that from phlegmonous abscesses; and is mixed with pieces of white substance resembling curds. The irregular wound, resulting from the spontaneous opening of the abscess, heals with difficulty, and the resulting cicatrix often constitutes an unsightly deformity. Where the scrophulous *vice* tinctures the organism deeply, the scrophulous inflammation first affects one gland and then another, and ultimately the individual may die of phthisis or tabes mesenterica. (*Rostan.*)

The scrophulous diathesis may exist through life, but, generally, under new evolutions of the system, it diminishes, and, at times, is wholly removed, or at least so modified, as, under avoidance of the exciting causes, to give no manifestations of its presence afterwards. Thus, under the changes that take place in the economy at puberty, a marked amelioration often occurs in the glandular and other affections that had previously existed; and, if not at that period, in the course of a few years afterwards, this desirable change may ensue. It is, indeed, important to bear the fact in mind, that nothing but a thorough change in the whole system of nutrition can be productive of essential benefit in these cases, in order that our therapeutical measures may be regulated accordingly.

Causes.—It has been remarked, (*Dubois d'Amiens*), that to study the causes of scrophulosis is to study its nature. This, however, applies to the investigation of the proximate cause of all diseases. A recent intelligent writer (*Stokes*) considers the lymphatics to be the veins of the tissues that are nourished by white blood, and scrophulosis to be owing to the predominance of white tissues in the economy, and to be nothing more than a chronic irritation of the white parts, and of the organs immediately connected with them. "We may look upon the scrophulous diathesis," he remarks, "as a condition of the human body, which is, to a certain extent, imperfect, and which is to be attributed to arrest of development. There is a period of fœtal life, in which the whole mass of the body consists of white tissues. According as the individual progresses towards maturity, the red tissues become more abundant; and when he arrives at maturity, the proportion between the tissues becomes completely altered, the red being now more abundant than the white. But if the process should happen to be arrested, either shortly after birth, or during life, we have then an individual of a lower degree of vitality, and approximating to the class of white-blooded animals. That we may reduce the

scrophulous diathesis to arrest of development seems to be borne out by other considerations. We find, in persons of a strumous diathesis, proofs of arrest of development in various parts, so that, whether we consider the question as to the development of the whole or of particular parts of the body, the same conclusion obtains. Scrophulous children have large heads, and it has been long known, that they are exceedingly subject to hydrocephalus. The great size of the head in this instance is reducible to the principle of arrest of development; and here we have some explanation of the fact of the activity of the intellectual powers in scrophulous persons. Again, scrophulous children have large bellies; and here we have another proof of the arrest of development. In the fœtus, the belly is larger in proportion than it is in the adult, and if the individual grows up with this predominance, it is a proof of arrest of development. The liver in the fœtus is, as we all know, very large. Now, it is a fact, that many persons of a scrophulous habit grow up with this fœtal condition of the liver; and, accordingly, we find this organ enlarged, not as the result of disease, but because an equal and proportionate increase of other parts has not gone on; and here we have another fact confirming the principle of arrest of development. Scrophulous children are observed to have small limbs, and contracted chests. Here, too, we again meet with the fœtal condition. In the fœtus, the chest is small and contracted, and the extremities are puny and ill developed. How beautifully this tallies with the state of the lung at that period of life when there is very little employment for the thorax, and when the active functions of the lung have not as yet been called into operation. This too, informs us, why it is that such children are so liable to affections of the lungs. We find, that scrophulous persons are of a feeble frame, and have weak and flabby muscles; and, in accordance with this, we find, on examination, that the muscular system, to a certain degree, represents the condition of fœtal life, that the blood is albuminous, and its proportion of fibrine small. We observe, that scrophulous children are subject to rickets, and that the proportion of phosphate of lime in their bones is small. Now, this is precisely the condition of the bones in the fœtus. Thus, whether we look to the whole or to particular parts of the body, we find that scrophula is reducible to arrest of development, and that there is not in it any virus, anything particular or specific, as has been erroneously imagined. To these considerations it might be added, that nothing is more common than to see those monstrosities, distinctly referable to local arrest of development, occurring in the scrophulous subject; and the statistics of monstrosity show, that in this respect the female sex predominates over the male."

Whether the views of Dr. Stokes be admitted or not, the arguments he has brought forward in support of them are certainly ingenious and plausible; and there can be no doubt whatever, that the formation of the frame in scrophula is one of defect, but

whether a defect owing to arrest of development—as suggested by Dr. Stokes—may admit of question. The author has always entertained the view, that the condition of the system of nutrition is such as to demand a mode of management, which will add to, rather than detract from, the powers; and radical error appears to him to have been incurred by those, who apply the rigid system of regimen and therapeutics to scrophulous inflammations, which are adapted for ordinary phlegmasiæ.

It has been argued by some, that the scrophulous constitution is implanted in organization, and that unless such a predisposition exists, generally derived from progenitors, the disease is not developed. (*Guersent, Lugol, Baudelocque.*) “The belief,” says a modern writer, (*Mackintosh,*) “is almost universal, that it (scrophula) is confined to an unhappy few, who transmit it from father to son, from one generation to another, far more regularly than they transmit their money or virtuous reputation.”

This transmission Dr. Mackintosh is disposed to doubt, “as many instances might be quoted where both parents were strongly marked with all the appearances described as scrophulous, and nevertheless their children were very healthy. On the other hand, cases are often seen, where the parents had no vestige of the complaint, and yet the children were scarcely ever without some of the affections generally denominated scrophulous.”

It can scarcely, however, admit of doubt, that an organization may be transmitted from progenitors, which may predispose to the development of scrophula under the application of favourable exciting causes. (*E. Warren, of Boston.*)

A recent writer (*A. Combe*) has remarked, that a very influential source of delicacy in children, is an habitually deteriorated state of health in the parents,—not exactly amounting to active disease, but arising chiefly from mismanagement or neglect, and showing itself “in a lowered tone of all the animal functions, and a general feeling of not being well.” Of all the causes of this description, habitual indigestion has been considered the most frequent and deteriorating to the offspring, and a very common cause of scrophula. (*Sir James Clark, A. Combe.*)

But, although such an organization may be thus handed down, it is equally unquestionable, we think, that the scrophulous diathesis may be developed *de novo*, by faulty nourishment, want of cleanliness and ventilation; imperfect clothing; exposure to cold and moisture, and restriction to small miserable habitations in crowded streets, or in manufactories where children are deprived of solar light. Even animals become scrophulous, when exposed to some of those influences. Sheep, when too closely folded together and deprived of their free range and accustomed food, and, indeed, all domesticated animals, if similarly circumstanced, are liable to affections that may perhaps, be esteemed scrophulous. A writer, already cited, remarks, that he has seen scrophulous affections produced in a short space of time in many of the domestic

animals by unwholesome feeding. By such means he has observed them purposely produced in poultry, rabbits and pigs. "A pig," he adds, "is called 'measly,' when it is affected with a very general disease of the glands throughout the body, which is well known to depend upon the manner in which it has been fed." (*Mackintosh.*)

The opinion of Dr. Mackintosh, in regard to glandular affections denominated scrophulous, is, that, they are generally engrafted on the constitution by improper food, and deficient clothing; by neglect, or bad medical treatment during the period of dentition; the progress of scarlet fever, measles, and other eruptive fevers, as well as during the ordinary eruptions and affections of the throat; and, lastly, that they are produced by mismanaging swollen and inflamed glands during their early stages. "Hence," he remarks, "it is a disease with which some of the members of almost every family in this climate (Scotland) are at one time or another affected. We see glandular affections in persons of every variety of colour of the hair, eyes, and appearance of the skin, and in every variety of constitution. I have, therefore, long ago persuaded myself, that they depend upon gastro-intestinal irritation, which point of pathology has been clearly established with reference to the most scrophulous of all scrophulous diseases, viz. that which is termed *tabes mesenterica*. This view is much strengthened by the following circumstances: scrophula is a frequent disease among the poor, and those who are fed upon large quantities of weak broth, coarse ill-baked bread, or hard indigestible puddings. From these causes, the disease is often seen in charitable establishments for children; and I have also seen it traced to English boarding-houses, where the children are crammed with hard pudding, before they are allowed even to smell meat, and are told; 'that the young ladies and gentlemen that eat most pudding shall have most meat.' Poor children!"

The nature of scrophula would appear, then, to be a vicious state of the system of nutrition, a special depravation of the nutritive actions, (*Dubois d'Amiens*;) yet this vice is not specific, and capable of being transmitted artificially. All the experiments that have been instituted, with the view of communicating the disease by inoculation, have failed. Hebréard, physician at the Bicêtre, could never render dogs scrophulous, either by rubbing their skins with the pus of patients affected with the disease, by applying a rag impregnated with it to the denuded skin, or by introducing it by inoculation. Scrophulous matter was administered with the food, by another experimenter (*Lepelletier*), to guinea pigs for several days in succession, and he injected it into the crural veins, and inserted it into the ganglions and lymphatics, without more success. It need scarcely be said, that such experiments on animals prove nothing in respect to man: they have, however, been extended to him; and the matter of scrophula has been mixed with the vaccine and inserted into the arm, without exciting scrophula,

and without inducing any modification in the course of the cow-pox. Many trials have, likewise, been made with the unmixed matter of scrophula, without the disease resulting. It has been properly observed, however, (*Dubois d'Amiens*), that this does not remove the objection to a child's being suckled by a scrophulous nurse; for, in such case, the milk cannot fail to participate in the depravation of the solids and fluids, and, therefore, to furnish an aliment but little adapted for the perfect nutrition of the young being.

The similarity between the condition of the system of nutrition in scrophulosis and tuberculosis has been referred to under another head. It was there shown, that although analogous, they can scarcely, perhaps, be regarded as absolutely identical. The period of life at which they respectively prevail is different; for whilst scrophulosis generally exhibits itself in childhood, tuberculosis is more common in the ages of adolescence and virility.

Treatment.—From what has been said of the nature and causes of scrophula, it is manifest, that the treatment must be both hygienical and therapeutical; and, that the former is, perhaps, of even more importance than the latter. Under the most favourable circumstances, a long time is needed to produce the requisite change in the system of nutrition. “The constitution,” says a modern writer, (*Dubois d'Amiens*), “in this disease, is like an edifice built of materials of bad quality. It is not, then, a partial change that is necessary, still less a simple modification. All the materials must in some manner be changed for others, and, to accomplish this, time is necessary. The double movement of decomposition and composition in the organism must be modified. It must be remarked, indeed, that it is not the same thing with the cachexiæ as with diseases essentially dynamic. In the former case, the disease is dependent upon the assimilation of elements of a bad nature; in the latter upon functional perturbations. To cure the latter, consequently, it is but requisite to restore the functions to their natural rhythm, whilst to remove the former, we have to wait for a new assimilation, and these effects necessarily require a long time.”

It is of course important, in the treatment of the scrophulous diathesis, that the patient should be removed from all those unfavourable influences, that have been described as concerned in the etiology of the disease; and hence, that he should leave a damp and restricted situation and dwelling, and select a purer air, and a habitation in which light and ventilation can be readily admitted. Exercise in the open air should, at the same time, be advised; and if the individual has been accustomed to insufficient nourishment, a diet, which is capable of improving the development of the frame, should be advised, and, with this view, animal food should be freely allowed.

Along with these hygienic cares, certain therapeutical agents may be properly administered. In this, as in every form of cachexia, the remedies to be employed belong to tonics and to a

class—eutrophics—to which the author has elsewhere alluded, (Vol. I. p. 33,) as comprising therapeutical agents, which, by being received into the blood-vessels, modify the condition of the circulating fluid, and through it the system of nutrition, without necessarily occasioning a sensible increase of any secretion.

Of the tonics, the various mineral and vegetable substances,—preparations of gentian, colomba, and, recently, of the leaves of the walnut (*Negrier*,) and other bitters,—chalybeates, and other mineral remedies of the class, have been beneficially administered; but they are far inferior to those of the second class.

Of these, the one that has been most extensively used, and, in the opinion of many, has been most useful, is iodine in some of its various forms of preparation. Soon after its introduction into notice, it was given in those affections internally, and was likewise prescribed externally, especially when the disease was manifested on the surface. In favour of its good effects numerous practitioners soon came forward with their testimony. (*Gordon, Sir A. Halliday, Magendie, Baup, Sablairolles, Baron, Brera, Manson, Wutzer, Lugol, Baudelocque*, and others cited in the author's *New Remedies*, 3d edit. p. 305, Philad. 1841.)

Lugol considers iodine to be the most efficacious remedy we possess in scrophula. He especially recommends the watery solution, which bears his name, internally, and baths of iodine externally. The fortunate results of his trials in the Hôpital St. Louis were corroborated by a committee appointed by the Académie Royale des Sciences to examine them. Perhaps no better form of preparation can be given than the solution of Lugol.

R.—Iodin. ℥j.

Potassii Iodidi, ℥ij.

Aquæ destillat. ℥vij. solve.

Dose, ten drops, gradually increased, three times a day, in sugared water.

The condition of the system in scrophula might appear to suggest rather the iodide of iron, in which we have eutrophic and tonic properties combined. Accordingly, it has been extensively used, and with valuable results. (*Phillips*.) Of this, a grain may be given three times a day, and the dose may be gradually raised to three grains.

R.—Ferri iodid. gr. xxiv.

Aquæ destillat. ℥j.—M.

A teaspoonful contains about three grains.

The codliver oil, which has been found to contain iodine, (*Kopp, Brandes*,) has been given largely in the various forms in which scrophula manifests itself, and we have the testimony of numerous physicians, of Germany especially, to show that its efficacy is marked. (*Schenck, Von dem Busch, Gouzzé, Taufflied, Jüngken*.) One writer, indeed, (*Schenck*) esteems it to be as certain a remedy in scrophula and rickets, as cinchona is in intermittent fever. The dose, for the adult, is half a spoonful to three spoonfuls, two or three

times a day in coffee or lemon juice. The author has had no experience with it.

Bromine, whose properties resemble those of iodine, has been given in the same cases, but it possesses no advantage over the other, and is by no means as easily attainable.

Within the present century, the preparations of gold have been brought forward in scrophulous, and some other, cachexiæ, with high recommendations. (*Chrestien, Eberle, Niel, Legrand, Herrmann, Kopp.*) Recently, they have been employed at the Hôpital des Enfants Malades, (*Baudelocque*), and at the Hôpital la Charité, of Paris. (*Velpeau.*) At the former institution, they were given in enormous doses, but without producing any effect on the disease. In this country, they have not been much used; nor do they seem to possess the efficacy that would recommend them to great confidence.

With many, there has been an objection to the employment of mercury in scrophulosis; and there can be no question, that where it has been pushed to such an extent as to induce salivation, or much mercurial irritation, it may prove injurious; but it is equally unquestionable, that in minute doses, it may occasionally produce benefit. Of late, it has been associated with iodine, and administered advantageously in various scrophulous affections, especially in such as were complicated with syphilis.

R.—Hydrargyri deutiodid. gr. v.

Micæ panis, q. s. ut fiant pilulæ lx.

Dose, two, morning and evening, gradually augmenting the quantity of the deutiodide.

Various other therapeutical agents have been used by different observers. The carbo animalis (gr. ij., three times a day) has been highly extolled by some practitioners, (*Weise, Kopp, Rothamel, Speranza*;) but, by others, it has not been used with advantage. (*Fricke, Baudelocque.*) The muriates of lime and baryta have likewise been given occasionally with good effect. (*Liq. calcis muriatis*, gt. xxx; or, *Liquor. barytæ muriatis*, gtt. v. three times a day.) The doses of both must be gradually augmented; and let the remarks, before made, be borne in mind, that long perseverance will be demanded in the use of whatever article is selected by the practitioner; and in no case must he expect benefit before several weeks have elapsed.

Thus much for the management of scrophulosis in general,—both when it exhibits itself only in the form of scrophulous cachexia; and when there are marked outward manifestations of the disease, as glandular swellings, superficial ulcerations, &c. &c.—many of which require the attention of the surgeon, and of one who is also well acquainted with internal pathology.

Where the glands of the neck are concerned, or scrophulous swellings exist in any part of the body, should they be accompanied with much inflammation, it may be advisable to direct the application of leeches even more than once, followed by an ordinary

bread, or other emollient poultice. In this way, the tumour may be discussed; but if the inflammation be more active than it usually is, and manifestly tend to suppuration, the pus should be evacuated as early as possible, by an incision made with a lancet in the direction of the folds of the integument, to avoid an unseemly cicatrix; and, for the same reason, the poultices, which may be deemed advisable to favour the suppuration, should not be continued so long as to render the integument so soft and thin that it subsequently sloughs off. Where the strumous swellings are more indolent,—along with the internal remedies and regimen inculcated above, many local applications may be made use of. The chloride of lime has been applied with advantage in the form of ointment,¹ as well as the aqua chlorini.²

¹ R.—Calcis chlorid. ℥j.
Adipis, ℥j.—M.

² R.—Aq. chlorin. part. j.
Adipis, part. viij.—M.

Iodine has been employed advantageously in the form of tincture, applied repeatedly by means of a camel's hair pencil. (*Wutzer, Davies.*) The ointments of iodine, of the iodide of potassium, of the ioduretted iodide of potassium, and the iodide of lead, have likewise been used with advantage, rubbed on the part night and morning. The iodo-hydrargyrate of potassium has been used both internally¹ and externally.²

¹ R.—Hydrargyri deutiodid. gr.
viij.
Potass. iodid. gr. viij.
Aquæ destillat. ℥viij.—M.

Dose, f. ℥ij. to f. ℥ij. in the twenty-four hours.

² R.—Hydrargyri deutiodid. gr.
vij.
Potass. iodid. ℥ij.
Adipis, ℥i.

An ointment of veratria has been strongly recommended, (*Turnbull,*) but it has not been much employed.

R.—Veratriæ, gr. x.
Adipis, ℥ss.—M.

A piece, the size of a hazelnut, may be rubbed in for ten minutes, twice a day.

Where ulceration has taken place, and it appears to be indolent, a solution of the acetate of lead,¹ or of the acetate of zinc,² may be applied warm with advantage.

¹ R.—Plumbi acet. ℥ss.
Aquæ, ℥vj.—M.

² R.—Plumbi acetat. ℥ss.
Zinci sulphat. ℥i.
Aquæ, ℥vj.—M.

Creasote water,¹ the protiodide of mercury,² as well as the deutiodide,³ may also be used as topical applications.

¹ R.—Creasot. ℥ss.
Aquæ destillat. ℥vj.—M.

² R.—Hydrarg. protiodid. ℥ij.
Adipis, ℥ij.—M.

³ R.—Hydrarg. deutiodid. gr. vi.
Adipis, ℥vj.—M.

When these remedies fail, conjoined with the employment of pressure by means of adhesive straps, and the various internal

agents already recommended, a thorough change of all the influences surrounding the individual should be advised. The sea shore is generally preferred, where the patient, in addition to a change of every influence, can have the benefit of sea bathing. The good effects, indeed, that have resulted from this course, have led to the belief, that the salt may have excited an important agency; and, accordingly, where removal to the sea shore has not been practicable or considered inappropriate, the application of a solution of salt to the scrophulous tumefaction has been recommended. Alone, however, the salt wash is possessed of but little efficacy.

The scrophulous affections, which implicate particular organs, fall under consideration elsewhere.

II. SCORBUTIC CACHEXIA.

SYNON. Lues scorbutica, Cacochymia scorbutica, Cachexia scorbutica; *Fr.* Cachexie scorbutique.

Under this head may be conveniently considered, affections that have, by many writers, been widely separated;—for example, sea scurvy, land scurvy, and the different forms of petechiæ, all of which have been classed under *Porphyra*, by one nosologist, (*Good*,) who defines it “livid spots on the skin, from extravasated blood; languor, and loss of muscular strength; pains in the limbs.” In consequence, also, of the appearance of the skin, they have been classed, by some, amongst cutaneous diseases. Willan has treated, under the head of *Purpura*, of the land scurvy, and of the petechial spots of malignant fever,—*Petechia contagiosa*; yet he has omitted sea scurvy—an affection almost identical with land scurvy. They are all, however,—as a general rule,—dependent upon a similar depraved condition of the fluids and solids, and therefore true cachexiæ.

It may be convenient, for description, to adopt the division into *Porphyra simplex*, *P. hæmorrhagica*, and *P. nautica*.

I. PORPHYRA SIMPLEX.

SYNON. Petechiæ sine febre, Phænigmus petechialis, Profusio subcutanea, *Purpura simplex*; *Fr.* Pourpre; *Ger.* Petechien, Peteschen.

This form of porphyra, which is usually classed amongst cutaneous diseases, appears often without any marked derangement of function. The spots are numerous, but small, and of the form of flea-bites, and appear chiefly on the breast, arms and legs, with paleness of the surface. At first, they are of a light red in the young, and darker in older persons. The eruption usually occurs at night, and is not perceived until the following morning. The spots are not numerous in the first instance, but they become more and more so in a few days; successive patches appearing as their precursors fade away.

The duration of this form of the disease is various,—from between three or four weeks to years. (*Schedel*.) Shortly after they

come out, they first grow darker, and livid, then yellow, and gradually disappear, to be again reproduced.

2. PORPHYRA HÆMORRHAGICA.

SYNON. *Purpura hæmorrhagica*, *Stomacace universalis*, *Hæmorrhagia universalis*, *Hæmorrhœa petechialis*, *Morbus maculosus hæmorrhagicus*, *Hémacelinose*, *Peliose*, Land scurvy.

This is a more aggravated form of the same affection, but even it is not always attended with febrile excitement, or with any very marked disturbance of the system. The spots are, in this case, larger, more numerous, of a darker colour and more irregular, so that, at times, the surface presents the appearance of large bruises, —often as if made by a whip—*vibices*.

The extravasation of blood, which occasions them, generally takes place into the substance of the skin, and subjacent cellular membrane; but, at times, the cuticle is elevated into blisters, which are filled with fluid blood. In the majority of cases, when these spots appear upon the skin, hemorrhage takes place from the mucous membranes—from those of the nose, mouth, stomach or intestines. Occasionally, too, it is discharged from the urinary organs; and in cases where hemorrhage does not actually take place from those membranes, spots, produced by the infiltration of blood—like those of the cutaneous surface—are seen on them. Occasionally, the loss of blood is very great and rapid, but, more commonly, the system suffers, and the patient often sinks under a more protracted and gradual oozing.

These last cases are always ushered in, or accompanied, by signs of great prostration, the pulse being usually small, quick, and easily compressible; but, at other times, more voluminous. Still, if proper attention be paid, it will indicate the oligæmic condition of the system. Commonly, too, unless the disease is very rapid in its course, serous infiltration takes place into the cellular membrane of the lower extremities. At times, too, the encephalic functions become greatly disordered; and the functions of respiration and circulation exhibit functional derangement by dyspnœa, palpitations, &c.

The disease is one of great danger, sometimes terminating in a few months, but, at others, continuing for years. The author has seen one or two cases, in which the infiltration of the lower extremities was considerable, which persisted for a long time without the general health appearing to be much deranged.

The cause of this variety seems to be defective hæmotosis, which may be induced from various causes. It would appear, that certain persons are particularly predisposed to it. It occurs in those of broken down constitutions; in such especially as have long resided in malarious regions, and who suffer under hypertrophy or atrophy of the liver or spleen.

The author has elsewhere referred to the “splenic cachexia,” as it is termed in India, which is accompanied by all the signs of this

form of purpura as well as of the next, and which is evidently connected with, and perhaps dependent upon, an hypertrophied or atrophied state of that viscus.

Very recently, the author has had a fatal case of this form of diseased spleen under his care, in which the organ was greatly enlarged, and encephaloid in certain portions. All the signs of porphyra hæmorrhagica supervened with hydropic infiltrations of the lower extremities, under which the patient died. In another case of porphyra, which also fell under his care, the spleen was sound, but the liver was scirrhus, and incurable jaundice preceded the fatal termination.

When the parts in a case of porphyra are examined after death, the appearances are such as might be anticipated from the functional phenomena. Large ecchymoses, in which the blood may be concrete, but is more generally semifluid, are observed under the cutaneous integument, or in the submucous cellular tissue, according to circumstances,—with more or less effusion of blood into the serous cavities, or into the tissue of the parenchymatous organs.

The blood is generally perhaps altered in its appearance and general properties;—instead of looking opaque and black, and coagulating as usual, and separating into serum and crassamentum, it continues, as in porphyra nautica, tremulous, translucent, and is of a light red, like thin currant jelly. In other cases, however, its appearance has been that of health, or it has even been buffy. (*Parry, Babington.*) This subject will engage attention presently, when the similarity of the second and third varieties of porphyra have been considered.

Although, in the generality of instances, the disease appears in broken down constitutions, and where abdominal mischief has occurred in some of the solid viscera of the abdomen, it would seem to happen occasionally in young persons living in country situations, and previously enjoying good health, and provided with all the necessaries and comforts of life. (*Bateman.*) This circumstance—as properly remarked—tends greatly to obscure the pathology of the disease, as it appears to exhibit a wide difference between the porphyra hæmorrhagica and the true sea scurvy, to which it has been generally referred. The diet, indeed, which appears to be essential in the latter affection, produces no alleviation of the former; and although, in both cases, hæmatisis is manifestly interfered with, it would seem, that in the porphyra hæmorrhagica, it may be dependent upon visceral engorgements of a temporary nature, which may be relieved by blood-letting and cathartics, that might be very injurious in the porphyra nautica or true scurvy, which is always dependent upon insufficient nourishment. (*Bateman, Schedel, &c.*)

III. PORPHYRA NAUTICA.

SYNON. Scorbutus, S. nauticus, Purpura nautica, Scurvy, Sea scurvy; *Fr.* Scorbut; *Ger.* Scorbut, Scharbock.

The definition of this variety—which is the true scurvy—as given by one nosologist, (*Good*), is as follows:—"Spots of different hues, intermixed with livid, principally at the roots of the hair; teeth loose; gums spongy and bleeding; breath fetid; debility universal and extreme;" and he adds—"occurs chiefly at sea, after exposure to a moist, cold, and foul atmosphere, with long use of salted food and stagnant water."

The disease is certainly not confined to mariners; for well marked cases of land scurvy have occurred, and prevailed extensively in large institutions. An epidemic of this kind in the extensive penitentiary at Milbank, near London, was the occasion of much professional interest, about twenty years ago.

At sea, the disease is far less common than it was formerly, owing to the hygienic precautions, that are now taken, and which consist chiefly in the allowance of a larger admixture of animal and vegetable food to the sailors. Ages ago, it was a most formidable affection, and interfered materially with the efficiency of seamen on long voyages. Now, we rarely hear of it. It would appear, also, to have prevailed largely in armies; for we are told, that the army of Saint Louis before Damietta was decimated by it.

The author has not witnessed any case of sea scurvy, but he has seen a few cases of the disease on land, which presented all the characters assigned to it.

The disease generally comes on gradually, with feelings of general debility, disinclination to motion, and difficulty of breathing on the least exertion. The face becomes of a pale or yellowish hue; the gums are tumid, soft, spongy, and sometimes livid, and they bleed on the slightest friction; the breath is very offensive, and the skin dry and rough, but sometimes smooth and shining. If attention be paid to the cutaneous surface, it will generally be found covered with livid spots, which run together, so as to form large blotches, especially about the legs and thighs. The legs swell, and ultimately the whole body becomes œdematous. All the phenomena, indeed, resemble those that have been described as characteristic of Anæmia.

Throughout the disease, excessive pain is usually experienced in the limbs, with total mental prostration, so that the individual is incapable of any intellectual effort.

If sores exist, they discharge a fetid or bloody sanies, and put on characters, which have received the epithet "scorbutic,"—the base of the sore being covered with sloughs, and the edges livid, and lined with a soft, bloody fungus, which increases rapidly.

In the advanced period of the disease, the emaciation is great, and there is a tendency to syncope on the slightest exertion. He-

morrhage takes place, at times, profusely, from the different mucous membranes; and the patient dies, in unfavourable cases, either hydropic, or exhausted by some sudden exertion.

In the course of the disease, inflammatory affections may supervene in internal organs, so as to occasion some degree of reaction—as increased heat, greater frequency and force of pulse, &c. This circumstance is of unfavourable import, for there is usually so little vitality in the patient, that they exhaust him the sooner.

On dissection, the same appearances are presented as in porphyra hæmorrhagica. Effusions are found in the different cavities, in the substance of the skin, in the subcutaneous and intermuscular cellular tissue, and in the muscles themselves. At times, the blood is coagulated; but almost always it is extremely fluid; the different solid viscera are softened, and contain collections of blood; the spleen and lungs are engorged in this manner; the heart is flaccid, and the mucous membranes—like the skin—are covered with numerous hemorrhagic patches; but the encephalon and its dependencies are said to exhibit no marks of mischief. (*Rochoux.*)

Since the advances that have been made in organic chemistry, no opportunities have occurred to examine into the exact condition of that fluid; or if they have occurred, they have not been embraced. According to one of the older observers, (*Rouppé,*) as the cachexia makes progress, the blood becomes as black as ink, but less plastic;—in other words, the quantity of fibrine diminishes. Such appears to have been the case with the blood of scorbutics described by Lord Anson's surgeons, (*Ettrick* and *Allen.*) In other cases, however, it has been found either natural or buffy; (*Lind;*) and such—as already remarked—is the character it presents at times in porphyra hæmorrhagica. In two cases of purpura on record, (*Parry,*) blood, drawn from the arm, exhibited a tenaceous contracted coagulum covered with a thick coat of lymph; and in another instance, in which the patient, a man forty-five years of age, had most of the symptoms of sea scurvy, such as general cachexia, anasarca of the lower limbs, great depression of spirits, and prostration of strength, extensive ecchymoses on the trunk and extremities, fetid breath, and extravasations of blood from the gums, stomach and bowels, as well as from a large foul ulcer on the leg,—a copious venesection demonstrated, that the blood had not, in any degree, lost its crasis, the crassamentum being covered with a thick buffy coat, and having as much firmness as is usual under the existence of such a state. (*B. Babington, Budd.*) These cases corroborate a remark, elsewhere made by the author, that the buffy coat may present itself on blood, which is in a very opposite condition, in other respects to what is seen in active phlegmasia. (See vol. i. p. 456, and *General Therapeutics*, p. 413, Philad. 1836.)

The causes of sea scurvy are generally sufficiently evident;—in this respect differing from the first two varieties of porphyra. At one time, it was believed to be owing to the continued use of salted

animal food; but although it actually occurred under the use of this variety of aliment, the precise cause was probably mistaken. It would appear, indeed, that if omnivorous man—accustomed, that is, by habit to both animal and vegetable food—be restricted to either one or the other exclusively, his nutrition falls off, and he may become scorbutic. It is the want of mixed diet, therefore, on long voyages, which gives occasion to scurvy. That salt provisions are not necessary to its production is sufficiently shown, indeed, by the fact, that it has often occurred where no salt provisions were used. In the Milbank Penitentiary, it prevailed extensively in 1819, when the diet consisted of peas, barley soup and brown bread, (*Latham, Roget*); and in cases of diabetes, in which the author has seen restriction to vegetable diet tried, with the view of breaking in upon the morbid condition of the system of nutrition, which prevails in that anomalous disease, every symptom of scurvy has been induced.

At one period, it was supposed, that the salt of the salted provisions found its way into the circulation, and acted upon the blood in the body, as it does out of it, by preventing its coagulation. The fact, that the disease originates where no salted aliment is used would be a sufficient reply to this notion; and, moreover, the appearance of the blood, especially as the disease advances, is the reverse of what it would be on the addition of salt, which, instead of making it black, and causing it, on standing, to become thick, muddy, and of a greenish hue, would give it a fine scarlet tint, that would remain permanent until it began to putrefy. (*B. Babington.*)

The main cause of sea scurvy is, doubtless, the one that has been assigned above; but the disposition to the disease may be augmented by want of cleanliness, imperfect ventilation, want of due exercise and a cold damp atmosphere.

Treatment of the different forms of porphyra.—In the two first varieties of porphyra, no rule of practice can be laid down, which can be universally applicable; whilst in the last, the treatment is clear.

In the simple form of the disease, as in the hemorrhagic, attention must be paid to the condition of the system at the time, and the circumstances under which the individual was attacked. If petechiæ occur in one who has been previously in good health, and who has not been exposed to the ordinary exciting causes,—as insufficient diet, impure air, &c.; and if the accompanying symptoms denote vascular activity, it may be necessary to take blood; but care must be observed not to do this incautiously, or to carry it too far. In almost all such cases, cathartics will be decidedly beneficial, and no better combination can be given than the sulphate of magnesia with an excess of sulphuric acid, which may be administered so as to keep up an action on the bowels.

R.—Magnes. sulphat. $\mathfrak{z}$ ss.

Acid. sulphur. dil. gtt. xxx.

Aquæ, $\mathfrak{z}$ vss.—M.

Dose, two tablespoonfuls, three times a day.

This plan may even be necessary in cases of the porphyra hæmorrhagica; but it need scarcely be said, that it cannot be admissible where there are undoubted evidences of the existence of an impoverished state of the blood, with unusual laxity of the solids. In this case, the remedies become appropriate, which are needed in the true scurvy.

The diet, too, must be regulated according to the same rules, and whilst a nutritious system may be appropriate in certain conditions of the system, as in those just referred to, it may be extremely questionable or even improper in others.

In the generality of cases of purpura, after cathartics have been given for a few days, the iodide of iron is a valuable preparation. The author has elsewhere remarked, (*New Remedies*, 3d edit. p. 233: Philad. 1841,) that "in oligæmia, where there is paucity of red globules in the blood, and the fluid is altogether too thin, it would seem to be especially indicated, from its property of promoting the coagulation of the blood, and, therefore, of inspissating it. Hence, in all cases of scorbutic, hydropic, and other dyscrasies, and in hemorrhages occurring in such pathological conditions of the system, we have prescribed it largely with the very best effects. It appears to us, indeed, to be the best remedy we possess wherever a sorbefacient and tonic are indicated."

R.—Ferri iodid. gr. xxiv.

Aquæ destillat. ℥j.—M.

Dose, a teaspoonful, three times a day.

As regards the treatment of the porphyra nautica or true scurvy, it has been already observed, that it is clear; and the mode of prevention—it may be added—is obvious. The most important cause—as has been remarked—is defective alimentation, arising either from a change of diet; or more generally from restricting one who has been accustomed to both animal and vegetable food, to either of these exclusively.

For plenary health, it is necessary, that man should have variety of aliment, and that if he has been accustomed to a mixed diet—animal and vegetable—it cannot be abandoned with impunity. In the way of prevention of scurvy, consequently, it is indispensable, that a mixed diet should be furnished; and, with this view, vegetable substances, as lime-juice, sugar, vinegar, &c., are allowed in proper proportion in long voyages; and under this system, combined with a due attention to regimen—as personal cleanliness, warm clothing, proper ventilation, exercise, and avoiding as far as possible the injurious influences of cold and moisture, scurvy has been almost banished from the list of diseases of seamen; and many a surgeon of the navy passes through life without meeting with a single case. In some of our eleemosynary institutions on land a want of proper attention to the powers of diet and regimen has produced the same effects as at sea, and has required similar remedies.

When the scurvy has broken out, and it is impracticable to

obtain a mixed diet, recourse must be had to the use of mineral acids, and the bark or the sulphate of quinia, or some of the vegetable tonics—gentian, colomboa, &c. There is no preparation superior to the cold infusion of bark with acid.

R.—Cinchon. cort. in pulv. crass. ℥j.

Aquæ, Oj.—Infunde per horas duodecim, cola et adde

Acid. sulph. dil. gtt. xxx.

Dose, a fourth part, four times a day.

The iodide of iron, administered as recommended under the variety of porphyra last described may also be a valuable remedy. Still, much cannot be expected from the therapeutical, unless it can be conjoined with proper hygienical, treatment.

A very recent writer (*Budd*) has remarked, that mercury, in every form, “should be religiously avoided: even in very small quantities, it has been known to produce dangerous salivation.” The remark is, doubtless, just; yet, in one of the lowest forms of porphyra, which ever fell under the author’s care, and in which salivation was accidentally induced by a very small dose of a mercurial cathartic, although severe salivation resulted, very much to the author’s regret, and gave rise to very sinister forebodings on his part, the symptoms were certainly not aggravated; and, under a pursuance of the course above indicated, the patient—a female—entirely recovered.

The local lesions, that present themselves in scurvy, are only evidences of the constitutional affection, but still they may require attention. Mouth washes of astringent and antiseptic substances, —as of the tincture of myrrh,¹ of cinchona with muriatic acid,² or of the chloride of lime,³ or of creasote,⁴ or of the iodide of iron,⁵ are often used with advantage.

¹ R.—Tinct. myrrhæ, ℥ss.

Mellis despumat. ℥ij.

Aquæ vel Aquæ rosæ, ℥iv.—M.

² R.—Calcis chlorid. gr. xv—xxx.

Mucilag. acaciæ, ℥j.

Mellis, ℥ij.

Aquæ, ℥iiss.—M.

³ R.—Infus. cinchon. ℥iv.

Mellis despumat. ℥ij.

Acid. muriat. gtt. xx.—M.

⁴ R.—Creasot. gtt. iv.

Mellis, ℥ij.

Aquæ destillat. ℥iiss.—M.

⁵ R.—Ferri iodid. ℥j.

Aquæ, ℥iv.—M.

Similar applications may be made to scorbutic ulcers; but it must be borne in mind, that all these local affections can only be combated successfully by the union of appropriate local means, along with such as are directed to the condition of the constitution on which they are dependent.

Amongst the Milanese, a singular endemic affection prevails, which has received various appellations, but is generally classed amongst cutaneous diseases. This is the *Pellagra*, *Lepra Mediolanensis*, *L. Lombardica*, *Scorbutus Alpinus*, *Paralysis scorbutica*, *Mania pellagria*, *Dermatagra*, *Erythema endemicum sive pellagrum*, *Mal de Misère*, *Insolazione de primavera*, &c.

Although termed *Scorbutus Alpinus*—the disease is not a scurvy, yet it belongs properly to the division of cachexiæ. It commences in the spring, with signs of gastric and cephalic disturbance, followed by an eruption of small red spots or patches on the parts that are exposed to the sun,—whence it is called by the Italians, *Erythema solare*. These patches, which are at first shining, are soon covered by scales similar to those of psoriasis, beneath which the skin becomes rough, thick, and chapped. In the autumn, the eruption disappears, but the general health continues to decline. In the following spring, the eruption recurs and with greater severity; and the constitutional symptoms become aggravated; the bowels especially are greatly disordered; epileptic paroxysms supervene, and, not unfrequently, the miserable sufferer becomes idiotic or insane; and sooner or later sinks to death.

The disease is not communicable. It is rarely met with except amongst the poorer classes, and with them all ages are liable to it.

Removal from the causes that induce the disease affords the chief—if not the only—prospect of cure.

III. CHLOROTIC CACHEXIA.

SYNON. Cachexia chlorotica, Chlorosis, Chlorasma, Dyspepsia chlorosis, Anepithymia chlorosis, Icterus albus, Febris alba, F. amatoria, F. virginum, Cachexia virginum, Green sickness; *Fr.* Chlorose; *Ger.* Weissucht, Bleichsucht.

Chlorosis has been a stumbling block to the nosologist; yet it seems impossible to refer it—with propriety—to any other position than to the cachexiæ, which is done, indeed, at the present day, by many of the best pathologists. Appearing in females generally, and according to some exclusively, and being often associated with retention, or obstruction of the catamenia, or some morbid condition of the menstrual function, it has been by many, and still is, associated with amenorrhœa. (*Cullen, Tissot, Pinel, Mackintosh.*) Dr. Good has placed it in the order Orgastica; or under diseases in which there is “organic or constitutional infirmity, disordering the power or the desire of procreating;” and he defines chlorosis, as follows—“Pale, lurid complexion; languor, listlessness; depraved appetite and digestion; mismenstruation.” Yet, the cachectic condition, which is met with in chlorosis, certainly exists at times in those of the other sex; and, consequently, the definition ought to embrace the pathological state of the system of nutrition, without regard to any derangement of sexual functions. Chlorosis has, indeed, been esteemed a variety of hysteria, (*Sydenham*), but the affections are little alike. By others, again, it has been referred to adynamia of the digestive tube, (*Galen, Young, M. Hall*;) whilst others (*Andral, Trousseau*) consider it to be dependent upon impaired or faulty hæmotosis; and, in the obscurity of the subject, it has been referred to a vice of innervation in the ganglionic system, which is supposed to preside over the digestive, circulatory, nutritive and genital functions.

When the disease is once developed, every function becomes more or less affected; and not only is the blood of morbid character, but the various tissues, which it bathes, become equally implicated; so that it properly falls under the division in which it is placed in this work.

Diagnosis.—At the commencement of an attack of chlorosis, the patient feels unusual langour with great depression of spirits, crying frequently without any obvious motive; and almost always suffering under more or less dyspnœa and yawning; the circulatory function, also, exhibits aberrations, and palpitations are frequent. Gradually, the disease augments; the countenance becomes pale; the eyelids puffy, and, in the morning especially, surrounded by a blackish circle; and the sclerotica is extremely white. The surface is usually dry and lurid; the pulse is very rapid, generally weak; but sometimes quick, and with a degree of apparent force that may deceive as in anæmia. (q. v.) Along with these phenomena, nutrition falls off; the flesh is soft and flabby; and hydropic infiltrations take place into the cellular membrane, and similar effusions into the cavities.

Sooner or later in the disease, the appetite becomes greatly diminished, and often wholly annihilated; or it undergoes the most wonderful mutations,—substances being greedily desired and enjoyed, that are possessed of no nutritive properties whatever,—such as chalk, earth, and ashes. At other times, there is a marked desire for acids. The author had an intelligent female patient, who preferred eating slate-pencils to any other article. When these depraved appetites exist, the digestion is generally impaired, and there may be more or less febrile movement, with alternations of constipation and diarrhœa. The urine, too, is usually small in quantity, and watery, as is commonly the case in nervous diseases.

Occasionally, hemorrhages take place from the mucous membranes, as described under Porphyra, and under Anæmia—of which chlorosis is unquestionably an occasional form.

When chlorosis occurs in the female—as is generally the case—it almost always happens, that there is leucorrhœa, with a total suppression or marked diminution of the catamenia, and when these do appear the fluid appears to contain but little colouring matter, and less fibrine than usual.

The symptoms, which may be properly referred to the nervous system,—as dulness of intellect, fanciful notions and projects; insomnia, or distressing dreams, and other hysteroid or nervous phenomena,—persist throughout the whole disease; and there is generally headache with tinnitus aurium, neuralgic pains and palpitations in the epigastric or cardiac region. The encephalic phenomena have been ascribed to the influence of the state of bloodlessness on the encephalon. (*M. Hall.*) In unfavourable cases, the patient becomes gradually emaciated, and dies hydropic, or worn down by hectic. In the majority of cases, however, the

disease terminates favourably under appropriate management;—but it is necessary that the treatment—therapeutical as well as hygienical—should be persevered in for a considerable period.

Amongst the strange phenomena, that attend this singular malady, may be reckoned—the signs afforded by auscultation of the blood-vessels. One of these has been termed *bruit de diable* in consequence of its resemblance to that of the *diabie* or humming top of children. It is heard most frequently along the carotid and subclavian arteries; at times, also, in the crural arteries, but never to the same degree. Commonly, it is heard on one side only. The *bruit de diable* disappears immediately on compressing the artery below the part at which it is heard; disappears, also, on pressing the artery forcibly with the stethoscope; and, what is surprising, the *bruit* often appears and disappears from one minute to another, without our being able to detect the cause of these alternations. At times, the mere change of the patient's position is sufficient to effect this. “During a year and a half,” says a practised auscultator (*Raciborski*), “that I have punctually attended the clinical visits of M. Bouillaud, I have observed more than thirty times the *bruit de diable*, and have not seen a single patient affected with chlorosis that has not presented it.”

It would appear that this sound is connected with the predominance of the watery portions of the blood, but the precise mechanism of its production is not very intelligible. The noise has been observed to follow copious blood-letting, and to disappear, when the blood has regained its properties under the use of tonics. (*Raciborski*.) The writer, just cited, remarks, that the *sifflement musical* is more frequent in thin and nervous persons affected with chlorosis; and the *bruit de diable*, in the stouter.

When blood is drawn in chlorosis, it commonly possesses the qualities referred to above. It is thin, light-coloured, and coagulates weakly—being deficient in red particles, and in fibrine. The clot is of less proportion to the serum than in health, and it coheres loosely. To the deficiency of red particles have been assigned, the diminished temperature of the surface; the pallor and waxy appearance, as well as the want of colour in the catamenia, and the pale stain, which the blood, in cases of epistaxis, leaves upon linen. (*B. Babington*.)

Some analyses have been made of chlorotic blood. In two well marked cases, it contained 871 and 852 parts in a thousand of water, instead of 780, the healthy standard; and the colouring matter amounted to 48.7 and 52 respectively, instead of 133. The albumen and salts were in the usual proportion. (*Jenkins, B. Babington*.) In other cases, which occurred to different observers, the following were the results:—

	Cruor.	Serum.	Fibrine.	Water.	Iron.	Total.
1. Chlorotic female,	83.70	83.45	6.35	832.45	4.35	1000
2. Healthy do.	134.00	88.20	25.70	743.90	8.20	1000

It has been remarked, that in a first degree of chlorosis, the ex-

ternal evidences may be so slight that the case might at first be mistaken for one of plethora; on analysis, however, there are found fewer red globules than in the healthy state, although the diminution, as yet, may be inconsiderable. In the advanced stages of the disease, the globules are found farther diminished than in any other disease, except where the system has been exhausted by copious hemorrhage. In one of these latter cases, the proportion of globules descended from 127 in a thousand—the normal proportion—to 21. In uncomplicated chlorosis, the proportion has been found as low as 38; but, generally, it is about 50. (*Andral* and *Gavarret*.)

Causes.—The disease occurs most frequently in young females about the period of puberty, and is generally associated with retention or imperfect establishment of the catamenia. These circumstances are, indeed, so commonly associated with chlorosis, that the term, with the public, is usually considered to be restricted exclusively to the condition as occurring in young females, in whom menstruation has been imperfectly established. Married women, however, and, as already remarked, even males have been affected with it, although this does not often happen.

Every agency, which is debilitating to the economy,—as food difficult of digestion, and containing but little nutriment; dwelling in malarious and other unhealthy localities, where cold and moisture predominate, must, also, be regarded as amongst the predisponent causes. It is affirmed, too, that this form of cachexia has been induced in young women, who have been in the habit of drinking vinegar, with the view of diminishing their embonpoint.

Pathological characters.—When chlorosis proves fatal, it is generally by the supervention of some organic mischief. On dissection, no appearances characteristic of the disease are met with, unless it be the altered character of the blood. In some cases, it is affirmed, (*Lieutaud*,) the veins and capillary vessels have been found almost exanguious. The organic mischief, observed in the liver and spleen; the tubercles in the lungs; the serous effusions into the cavities of the pericardium, pleura, peritoneum and arachnoid, in those who have died of chlorosis, are not pathognomonic of the disease, but mere complications, which are met with under various pathological conditions.

Treatment.—This may be conveniently divided into the hygienical and the therapeutical.

It will, of course, be all important to remove the patient from the action of predisposing and exciting influences; to regulate the diet, according to the circumstances of the case; to change an unfavourable locality for one that is more suitable; and to direct proper exercise, which, of itself, has appeared to cure many cases. It is, however, impracticable to lay down any rules of diet or regimen that are applicable to all cases; but the history given of the disease will have shown, that a generous diet must usually be appropriate,—the essential object being to modify and render more

energetic the whole function of nutrition, and especially by improving hæmatisis. Perhaps, there is no case in which a change of all the influences surrounding the individual is more important, and hence the well known value of travelling air and exercise. As the preparations of iron—it will be seen presently—are valuable therapeutical agents in chlorosis, it may be well to encourage the patient to visit some chalybeate springs, of which we have so many in this country; but as the benefit to be derived will be greatly augmented by a thorough change of atmospheric influences, those springs that are situate at a distance from the place in which the patient has dwelt, and the air of which is essentially different from the one to which she has been accustomed, had better be selected.

Upon the same principle, the revulsion, induced by the state of utero-gestation, will frequently completely remove this cachexia,—a fact which has been mentioned even by Hippocrates. Should, however, the constitution of the patient be much shaken by the continuance and severity of the disease, it may be well to advise that the patient should be subjected to an appropriate treatment, before she marries.

From the general character of the disease, tonics are clearly indicated; and of these, the preparations of iron have been found most serviceable. There is scarcely, however, a vegetable or mineral tonic that has not been given, alone or associated with the preparations of iron. A recent writer (*Carrère*) announces, as the result of an extensive clinical experience, that in almost every case in which a chalybeate preparation has been found decidedly useful, one single symptom has been constant and uniform, and has always served as a touchstone for the treatment to be employed,—the “blowing sound,” or *bruit de diable*, in the large arterial trunks.

Of the preparations of iron, the one most employed, of late years, is the carbonate which has been given both in the form of protocarbonate, and of the ordinary subcarbonate of the shops,—the sesquioxide, of the London Pharmacopœia. Formerly, Griffith’s mixture—the *mistura ferri composita*—and the *pilulæ ferri compositæ* of the pharmacopœias, were relied on mainly; but an objection, brought against these, has been, that the protocarbonate readily acquires oxygen, and becomes converted into the subcarbonate or sesquioxide, so that the practitioner may be, in reality, administering a different preparation from that which he intended. To obviate this defect, M. Vallet has suggested, that the protocarbonate should be mixed with saccharine matter, which prevents the absorption of oxygen from the air. The mode of preparing the “ferruginous pills” of Vallet, is given elsewhere. (*New Remedies*, 3d edit. p. 214, Philad. 1841.) The author has not, from his experience, been able to assign a higher place to this article than to the subcarbonate, and other preparations of iron. It remains, indeed, to be seen, whether the conversion into the sesquioxide renders the preparation less efficacious. The dose of the protocarbonate is

commonly from twelve to twenty grains in the course of the twenty-four hours.

A medicine, which greatly resembles the *pilulæ ferri compositæ* of the pharmacopœias, and in which the iron, when newly prepared, is in the state of protocarbonate, has acquired great reputation in the south of France, on account of its beneficial agency in this disease. It is given in the form of pill, and is called after its inventor, (*Blaud*), "*Blaud's pills*." They are prepared as follows.

Take of gum tragacanth, in powder, six grains; water, one drachm; macerate in a glass or porcelain mortar, until a thick mucilage is formed; and if it be wished to prevent the formation of peroxide of iron, and to make the pills similar to those of Vallet, substitute, says M. Blaud, a drachm of powdered sugar for the mucilage. Add, afterwards, sulphate of iron, in powder, half an ounce. Beat well, until the mixture is quite homogeneous, and add subcarbonate of potassa, half an ounce. Beat until the mass, which soon becomes of a yellowish green colour, passes to a deep green, and assumes a soft consistence. Divide into forty-eight pills, which M. Blaud considers to be sufficient for the cure of a chlorotic patient.

M. Blaud commences with his "*antichlorotic pills*," in the dose of one a day; and in the course of a few days gives two, and afterwards three daily. Although he is aware of the chemical conversion that takes place, and that, from being pills of the protocarbonate, they become those of the sesquioxide, he maintains, very properly, that it is to therapeutical observation, and not to chemical experiments, that we must have recourse, in order to learn accurately the medical properties of any agent. "What signifies it to practitioners," he exclaims, "that my pills contain little or no protoxide of iron, provided that they cure chlorosis!"

The iodide of iron has also been found highly serviceable in chlorosis occurring in strumous habits, and it may be administered as directed under *Porphyra*. Of late, the lactate of iron has been brought forward with high encomiums. Some, indeed, (*Gelis* and *Conté*), are disposed to refer the beneficial agency of the protocarbonate to its becoming lactate of iron in the stomach, by uniting with the lactic, which is one of the gastric acids. This idea led them to administer the lactate of iron itself; and numerous others, (*Fouquier*, *Bally*, *Beau*, *Rayer*, *Nonat*, *Andral*, *Bouillaud*, and others,) have followed their example, and successfully. The freshly prepared lactate of iron is introduced into lozenges, in which the sugar prevents the superoxidation of the iron, and preserves the medicine. MM. Andral and Fouquier seldom exceed twelve grains of the lactate in the twenty-four hours, and M. Bouillaud never gives more than twenty. In the administration of all the preparations of iron, they should be begun with in a smaller dose, and may be gradually carried to a considerable extent.

After iron has been administered for some time, if the blood be examined, the proportion of the globules will be found to have risen. In one recorded case, the proportion promptly rose from 46 to 95 in the thousand. The other elements of the blood, except the water, which increases in consequence of the diminution of the

globules, remain—it would appear—unchanged. Thus, the solid matters of the serum, varying from 94 to 75, are maintained in their normal proportion, and the fibrine does not descend with the progress of the disease, or increase under the action of iron. This, however, applies to simple chlorosis, for if it be complicated by inflammation, there will be a marked increase in the proportion of the fibrine. (*Andral and Gavarret.*)

If, in the course of the disease, hyperæmia should exist in any internal organ, it may be necessary to take blood either generally or locally; but in the state of the system that usually prevails in chlorosis, ultimate good effects cannot result from any copious depletion, and therefore blood should only be taken where it appears to be indispensable.

It may be advisable, also, to administer occasional emetics—partly with the view of acting as simple evacuants, and partly, also, to induce a new action in the system. With the same views, cathartics may be beneficially employed; but it need scarcely be said, that in advanced periods of the disease, when all the functions languish, care must be taken not to use them too frequently. The good effects of sea-sickness, occasionally observed, have led to the greater employment of emetics; but the results were probably more caused by the revulsion from change of air and other circumstances, than by the mere evacuation of the stomach.

As constipation is not an uncommon accompaniment of chlorosis, and may have some tendency to react on, and keep up, the disease, it has been advised to administer cathartics freely. (*Hamilton, Senr.*) They may almost always be premised with advantage before tonics, and may be needed in the progress of the treatment; but reliance cannot be placed on them to effect a cure.

IV. RHACHITIC CACHEXIA.

SYNON. Rhachitis, Rachitis, Cyrtosis rhachia, Morbus Anglicus, Osteomalacia infantum, Rickets; *Fr.* Rachitisme, Nouure; *Ger.* Englische Krankheit, Zweiwuchs.

A variety of opinions has been entertained in regard to the pathology of rickets. It was at one period considered to be allied to syphilis. Others have thought it often originates in scurvy, (*Portal, Gregory;*) but the closest relationship would appear to be between it and scrophula. That it is a cachexia,* or vitiated condition of the solid and fluid constituents of the body, and of the system of nutrition generally, cannot admit of a question, and, accordingly, it has been classed by a late nosologist (*Good*) as a genus in his order Dysthetica or Cachexies. A recent writer (*Rostan*) thinks there is no proof, that the disease is dependent upon a morbid condition of the fluids, but that it is owing to a general condition of the system, which is but little known.

Although the disease must probably have existed at all times, it does not appear to have been described until the year 1650, when an accurate account was given of it. (*Glisson.*) It is, at the present

day, a rare disease in England, (*Geo. Gregory*), although called the "English disease," and is not often met with in this country.

Diagnosis.—One of the earliest symptoms of rickets is an unnatural softness of the flesh, with progressive emaciation, although the appetite may be unimpaired, and sufficient aliment be taken. The countenance becomes sallow; the abdomen protuberant; and the stools are often frequent and unhealthy. If the disease exist during the period of dentition, the process goes on slowly, and the teeth, as they appear, are manifestly unsound, and soon become loose and carious. But the modified condition of the osseous system is a great characteristic of the affection. Ossification is imperfectly accomplished; the fontanelles and sutures are more open than in strong vigorous children; and the head appears large in proportion to the rest of the body. The sternum is prominent, so that the individual is what is termed "chicken-breasted;" and if an examination be made, it will be found, that this is, in part, owing to a forward deviation of the vertebral column. The extremities of the long bones become spongy, and the joints, consequently, appear swollen. This is usually most marked in the wrists, ankles and knees. As the disease advances, the bones becomes so soft as to be unable to bear the weight of the body; and for this reason, as well as owing to the action of the muscles inserted into them, they become bent, at times, in various directions. The vertebral column, in which so many efforts centre, suffers especially, and the child becomes humpbacked. The pelvis, too, often suffers, and deformities arise, which, in the female, may give occasion to those difficult cases to the obstetrician, in which delivery cannot be effected by the natural passages.

In the form of endemic rickets—if it may be so called—which occurs at the foot of the Simplon, and is known by the name *Cretinism*—*Cyrstosis cretinismus* (*Good*)—the head is usually so small and misshapen, that the intellectual faculties are incapable of development, and the individual constantly remains idiotic; but, in slighter cases, it not unfrequently happens, that there is unusual mental manifestation in the rickety, and that they astonish by their precocity.

The disease is not a fatal one. In the generality of cases, nutrition improves; and with it, the condition of the whole system. One great danger is the supervention of serious maladies before the improvement of the constitution has taken place, under which the patient may succumb.

Aneurism and hypertrophy of the right heart are said to be the most frequent results, (*Rostan*); but statistical knowledge on this subject is utterly insufficient to enable us to state anything positively.

When the distortion of the limbs has not proceeded very far, the cachexia may be gradually got rid of; and, in the progress of childhood, and still more of adolescence, there may be little or no appearance of deformity; but in bad cases, and especially if the child

passes the first four years of his life without any decided evidences of improvement, he continues a miserable object for life. (*Glisson, Geo. Gregory.*)

Causes.—Although children are unquestionably born with a predisposition to rickets, they rarely exhibit any evidence of it, until towards the termination of the first year. At first, the progress of the disease is very slow, and almost imperceptible. Although, however, there may be no outward appearance of scrophula in the fœtus in utero, it must be imperfectly formed; and if we regard scrophula to consist in an arrest or insufficiency of development, the view would seem to apply *à fortiori* to rickets. A recent writer (*Geo. Gregory*) doubts, whether the constitution of parents has anything to do with the production of the disease, as inattention and neglect are, he conceives, quite sufficient to account for the phenomena. The last remark is true; but we have as little doubt, that much depends upon the condition of the parents, and that the Horatian observation, “fortes creantur fortibus et bonis,” is true within certain limits. (See the author’s *Human Physiology*, 4th edit. ii. p. 410: Philad. 1841.) A recent writer (*Most*) has remarked, that he has often noticed the children of mothers, who had been rickety in their childhood, particularly subject to gastromalacosis at an after period. The connection does not appear to be very close between those diseases, and the remark requires farther observation. It is but fair to presume, that parents, who have singly or together laboured under some cachectic vice, may impress their offspring with defective plastic energy; and, therefore, that diseases—like the one now under consideration—may have their foundation laid in this manner.

But although a predisposition may be thus laid in organization, such predisposition, as in similar cases, requires to be excited into action before the mischief can manifest itself. The most common occasional cause would seem to be—faulty nursing, and all those exciting influences which have been pointed out as productive of scrophulous diseases. The affection is noticed chiefly where children cannot obtain sufficient or appropriate nourishment, and where they are restricted from solar light, and air, in ill ventilated, and often damp apartments. Hence, it prevails chiefly in the lower ranks of life; and, amongst the children of those better off in the world, it is seen in those that are compelled to leave the breast, and are fed frequently on diet unsuitable to their age and condition. The milk of nurses, who are addicted to the use of spirituous liquors, would appear to have often induced it, especially where a predisposition, derived from progenitors, existed.

In many of the large manufacturing establishments of Great Britain, the children are proverbially misshapen and unhealthy. When the subject of the health of children in such establishments was brought before the British parliament, some years ago, by Sir Robert Peel, Mr. Owen, of New Lanark, stated, that although the children, employed in his manufactory, were extremely well fed,

clothed and lodged; looked fresh, and, to a superficial observer, were healthy, yet their limbs were generally deformed; their growth stunted, and they were incapable of making much progress in the first rudiments of education. On the same inquiry, a distinguished surgeon (*Sir A. Cooper*) stated, that according to his experience, the result of confinement is not only to stunt the growth, but to produce deformity.

Pathological characters.—Of the essence of the rhachitic cachexia, pathological anatomy affords us no more information than it does of the scrophulous. When the bones are examined, they are found to possess a deficiency of earthy matter, and, therefore, they have not their natural firmness. 100 parts of the dry tibia of a healthy subject of the age of fifteen were found to yield 46.4 of animal matter; and 53.6 of earthy; whilst the same quantity of the dry tibia of a rickety child contained 74 parts of animal, and 26 of earthy substance. (*J. Davy.*)

The internal lesions, found on the dissection of those who have suffered under rickets, are, as in scrophula, altogether incidental.

Treatment.—The same general mode of management, hygienical as well as therapeutical, must be pursued in rickets as in scrophula. A consideration of the etiology of the disease sufficiently shows the great importance of a properly regulated diet and regimen. Without it, indeed, no good can be effected.

The various preparations of iodine, and especially the iodide of iron, have been highly extolled, and are amongst our most valuable therapeutical agents. The mode of administering these and other agents is given under the head of Scrophulous Cachexia.

Care should be taken in all cases not to exert any improper pressure on the bones, which are flexible and pliant, and may have their shape altered by pressure. “When recovery is taking place,” says a recent writer, (*Maunsell*), “and the child is sufficiently old, well-regulated gymnastic exercises will often produce very good effects in expanding the chest, and straightening the limbs and spine; but they should be used very cautiously, and always with due regard to the delicate health, and impaired strength of the patient. Dupuytren was in the habit of placing a child with deformed chest, with its back against a flat resisting body, and then pressing with the expanded palm of the hand upon the sternum, so as to flatten the thorax from before backwards, and increase the convexity of the ribs from side to side. By repeating this practice from day to day, it is possible to effect much improvement in the shape of the chest; but force sufficient to cause pain should never be employed. All instruments for straightening the limbs or supporting the spine, are worse than useless, as they prevent the action and development of the muscles, which afford the only true means of restoring health and symmetry.”

The author has succeeded, in many cases, in rectifying curvatures of the spine, consequent on the malacosis ossium of rickets, by directing the individual to place a weight—say of fifteen pounds,

if the boy be ten or twelve years of age and active—in an inverted footstool or some similar contrivance, and directing him to walk for fifteen minutes backwards and forwards in the room, with the hands raised and holding on to the stool. In this manner, the muscles have been strengthened under the stimulus to straighten the spine with the view of supporting the weight; and in process of time, the curvature has been much diminished.

There are certain cases of defective development, which do not belong to rickets, inasmuch as there is no deformity of any organ; but the whole frame is developed on too small a scale, so that the individual does not attain the usual height. It is the opposite condition to that of the redundant development, which gives occasion to the formation of giants. How these modifications in the system of nutrition are produced, it is difficult to say. The impulse to the production of a living being of a definite size is laid in organization. Thus, we see a plant evolved from the seed of the size proper to the species; and in the case of the oviparous animal, the egg of which is removed from all paternal or maternal influence, the size of the animal, when full grown, is equally determinate. Such is doubtless, also, the case in the higher classes of animals, the young of which remain within the mother for a certain period, although subjected to but little influence from her.

Although, however, the impulse seated in the germ is sufficient to account, in many cases, for the defective development of the future individual, circumstances of privation during the period of utero-gestation, and, still more, during the earlier periods of childhood, may stunt the growth as they induce irregularities of development in rickets. In the case of rickets, it has been believed, that the influence of the father is more frequent and apparent, and, perhaps, the same may be affirmed of the defective development in question. Until the period of puberty, and a few years afterwards, it is difficult to form an opinion as to the degree in which it is likely to exist; but, when once observed, it is important to remove the youth, if possible, from all the circumstances in which he is placed, and to subject him to new impressions of every kind. With this view, travelling air and exercise, with the concomitant changes of scenery, society, and habits, should be recommended. This may be sufficient to impress new activity on the system of nutrition; but, in too many cases, no means will be of any avail, inasmuch as the defective development implicates the whole frame, and is almost always perhaps dependent upon original conformation, or rather upon an instinctive tendency derived from progenitors.

V. HYDROPIK CACHEXIA.

SYNON. Hydrops, Phlegmatia, Hyderos, Hyderodes affectus, Hydropisis; *Fr.* Hydropisie; *Ger.* Wassersucht, Wassergeschwulst.

It may be a question, whether dropsy ought to be classed amongst primary or idiopathic diseases. Perhaps in all cases, it may be

looked upon as symptomatic; yet the functional phenomena that characterize it are so marked, and so different from those of other diseases, that it has been a custom, which may well be retained, to consider it under a distinct head; and the author has found it convenient to treat of it in this place, inasmuch as a diathesis, a *cachexia*, or bad habit, is unquestionably induced under various exciting influences.

Dropsy has been a difficult subject to the professed nosologist; and it has been correctly observed by one of the most respectable of the class, (*Good*,) that "there is no genus of diseases, which has been more awkwardly handled by the earlier nosologists." "The term hydrops"—says the writer just cited—"does not occur in Sauvages, Linnæus, or Sagar, and only once in Vogel in the compound—hydrops *scroti*. Linnæus connects anasarca and ascites with tympanites, polysarcia, and even graviditas, into one ordinal division, which he entitles *Tumidosi*, and of which these constitute distinct genera. Sagar arranges all the same under the ordinal division of *Cachexiæ*. Vogel pursues the same plan with the omission of graviditas, which he does not choose to regard as a cachexy. Sauvages employs the term *hydropes*, but only in connexion with *partiales*, so as to restrain it to local dropsies; so that with him ascites is a hydrops; but anasarca is not a *hydrops*, and does not even belong to the same order; it is an *intumescencia*, under which, as in the arrangement of Linnæus, it is united with polysarcia and graviditas, while hydrops *thoracis* is an *anhelatio*, and occurs in another volume." Perhaps, in no situation could the disease or rather genus of diseases be better introduced than here. Under other heads, particular dropsies have been investigated; but some observations are necessary on the genus, and particularly on that which has been termed General Dropsy.

As the term hypertrophy has been employed to signify super-nutrition of the solid parts of the body, so *hypercrinia* has been used for an augmentation of the secretions, under which dropsy necessarily falls. The accumulations of serous fluid, however, which take place from the cellular and serous membranes, may not all be owing to increased activity of the vessels, which deposit the fluid. In health, a nice balance must be maintained between the quantity deposited, and that which is taken up by the appropriate vessels; and if, from any cause, the balance be destroyed, so that the secretory vessels are in a state of superexcitation, or the absorbent vessels in a state of diminished activity, whilst exhalation is to the healthy extent, accumulation of fluid may take place; and hence, the different dropsies, instead of being all active, and, according to some, owing to an inflammatory action, may be either sthenic or asthenic, and the treatment in the two cases may have to be essentially different. Moreover, as will be shown under the head of General Dropsy, and as has been shown under the special dropsies of serous cavities, the accumulation of fluid may be dependent upon different modes of mechanical obstruction to the

circulation, and to consequent transudation of the watery parts of the blood through the parietes of the vessels. Perhaps, the most general cause of dropsy is impediment to the free circulation of the blood in some solid viscus; yet this, of itself, is probably insufficient to account for the phenomena of dropsy, inasmuch as temporary obstructions to the circulation may certainly arise without any evidence of the hydropic diathesis. That such hydropic or leucophlegmatic state may be induced requires a special condition of the vessels concerned in the deposition and absorption of the fluids, which, in a state of health, lubricate the cellular and serous membranes; but of the precise pathological alteration we have no accurate knowledge. The blood itself is, likewise, modified in its characters, and the action of the whole system of nutrition impaired, so as to give rise to the laxity of fibre and paleness of surface, which characterize all hydropic affections, and especially those of the general cellular membrane. The characteristics of the hydropic diathesis are few in number, but they are very unequivocal. They consist of—diminished secretion of urine, thirst, œdema of the feet and ankles, and a peculiar expression of countenance, to which the term *leucophlegmatic* has been applied. (*Geo. Gregory.*)

1. *General Dropsy.*

SYNON. Anasarca, Hydrops cellularis totius corporis, H. cellulosus, Hyposarcidiosis, Leucophlegmatia, Aqua inter cutem, Hydrops cutaneus; *Fr.* Anasarque, Hydropisie générale; *Ger.* Hautwassersucht.

By anasarca or general dropsy is understood the infiltration of a serous fluid into the cellular membrane, characterized by general tumefaction of the body, paleness, softness, coldness and loss of elasticity of the tegumentary covering. When the disease is partial, it is termed *œdema*.

Anasarca has been divided into the *idiopathic* and the *symptomatic*; but the more we become acquainted with the pathological relations of different portions of the economy, the smaller we find the number of idiopathic dropsies. In the generality of cases, we can sufficiently appreciate the primary lesion that gives occasion to the loss of balance between the exhalents and the absorbents; but, in other cases, we are compelled to infer that a morbid condition of those vessels exists, which we are unable to ascribe to any manifest cause. (*A. Nonat.*)

Diagnosis.—There are certain functional phenomena, which are common to every form of dropsy; and first of all, swelling of the body—generally of the lower extremities, in the first instance—which commences around the ankles, and gradually extends upwards, until it ultimately gains the whole body. The accumulation in the lower limbs is more apparent in the evening, when the individual has been up during the day, and it may be scarcely apparent on first rising in the morning. The cause of the greater swelling of the ankles in the evening is the gravitation of the fluid from the upper parts of the extremities and the body, and the ready com-

munication that exists between the various parts of the cellular membrane. At times, the tumefaction is first observed on the face or upper limbs; and, at others, it affects the whole of the cellular membrane almost simultaneously.

The swelling is greatest where the cellular membrane is most lax,—as around the ankles, the scrotum, loins, and in the eyelids; and, in proportion as it augments, the skin becomes smooth and tense; its rugæ are effaced, its elasticity diminishes, and when the parts are pressed upon by the thumb or fingers, the depression remains for a long time. Under the pressure, the fluid is forced into the neighbouring parts of the cellular membrane, and it is not until the cells, from which it has been pressed, have become refilled, that the depressions disappear.

Whilst the infiltration takes place into parts of the cellular membrane which admit of distension, those parts of the body, that are not infiltrated in any quantity, exhibit defective nutrition:—thus, the cheek bones become prominent; the ribs marked under the skin, and the fingers attenuated. Occasionally, the distension occurs so rapidly as to induce considerable pain, and when the fluid has accumulated to a very great extent, the epidermis cracks, so as to leave whitish cicatrices after the cure, similar to those that are observed on the abdomen of a female, after delivery. At times, too, the fluid transudes through the skin in minute drops; and, at others, it accumulates under the epidermis in the form of vesicles, from which it may be absorbed; or the vesicles may be ruptured, and a copious oozing may take place from the denuded surface, which, in rare cases, has been the means of removing the infiltrated fluid, and a cure has been effected. The skin is generally of a pale hue; but, at others, it is red or livid: commonly, it is streaked by the veins distributed over it. Its temperature is usually below the natural standard; but, occasionally, from causes within or without the economy, some part of the cutaneous surface is attacked with inflammation, which has a strong tendency to terminate in gangrene. The parts, too, that are subject to pressure, where the infiltration is to a great extent, are liable to slough, and large gangrenous eschars are thrown off, which are the source of much inconvenience, and are often the cause of a more rapidly fatal termination.

The character of the pulse, like the temperature of the skin, varies according to the condition of the system connected with the dropsy. If there be much activity, the pulse may possess the ordinary characters of the pulse of phlegmasia. If, on the other hand, it presents itself in a person of feeble constitution and impoverished blood, the pulse may be feeble. The digestive functions may be unimpaired, or they may suffer more or less; and, not unfrequently, under the constant irritation, diarrhœa supervenes, which may be favourable or unfavourable, according to its degree, and to the character of the dropsy as to *sthenia* or *asthenia*. Frequently, too, the dropsical affection implicates, more or less, other

mucous membranes, and gives occasion—for example—to bronchorrhœa, (q. v.)

The urinary secretion is almost always diminished in quantity, and, at times, is nearly suppressed. Its qualities vary very materially; but generally, it contains the same elements as in health, but in different proportions. At times, however, a large quantity of albumen is found in it, and, along with this, a diminution in the quantity of the urea. These additions generally coincide with a granular condition of the kidney, the characters of which have been described elsewhere. It is, consequently, of importance to test the urine in all cases, with the view of noticing especially, whether it contains albumen.

Anasarca, when it has made considerable progress, generally affects, more or less, the respiratory apparatus, and gives occasion to difficulty of breathing. Commonly, in its advanced stages, there is effusion into the different splanchnic cavities, which causes dyspnœa; but the same result may be induced by the infiltration of the submucous cellular tissue of the bronchial tubes; and of the cellular texture that goes to the formation of the lungs. The like pathological condition gives occasion to more or less cough in the generality of cases, which is sometimes dry, at others moist.

The disease is, of course, more or less dangerous, according to the causes that engender it. The active form, which occurs in persons previously in good or tolerable health, and of fair constitutions, generally terminates in health; whilst that which occurs in persons of broken down constitutions, and is merely an evidence of some serious visceral mischief, or aberration in the system of nutrition, is of extremely unfavourable prognosis. The dropsy, that is dependent upon granular disease of the kidney, is, likewise, of unfavourable prognosis, but it is, unquestionably, often cured. The author has several times succeeded in removing this form of dropsy in very unpromising cases; but it is liable to recur.

When anasarca supervenes in the course of long protracted diseases, the prognosis merges in that of the disease of which it is symptomatic. Simple œdema of the lower extremities is a very common accompaniment of the last stages of serious chronic lesions, but it rarely demands special management.

Causes.—It has been already remarked, that in all cases of dropsical accumulation, there must be a loss of balance between the vessels, whose office it is to deposit the serous fluid, and those whose office it is to take it up. Into the causes that give occasion to this loss of balance, it is now proper to inquire.

One of these would seem to be an excited, if not an inflammatory condition of the serous or cellular membrane, giving rise to what has been termed *active* or *sthenic* dropsy; the fluid accumulating—in the case of anasarca—in the cellular membrane, under a process similar to that which is established when a blister has been applied to the skin, or when fluid is effused in a part affected with phlegmonous or erysipelatous inflammation.

This form of dropsy usually occurs in strong active individuals, and under circumstances which give rise to a sthenic condition of the system;—as about the period of the first establishment of the catamenia, if this be effected with difficulty; or on the suppression of some periodical evacuation or source of excitement. It is often, also, witnessed at the period of desquamation of scarlatina, and, occasionally, at the termination of measles. (*Dubois d'Amiens, Andral.*)

The most common cause of dropsical infiltration unquestionably is—an impediment to the circulation of the blood, either in the great central organ, or in some portion of the venous system. Very frequently, this impediment to the circulation in the heart would seem to consist in a morbid condition of the valves, which, owing, often, to dilatation of the cavities of the heart, become insufficient to close the openings, and, consequently, seriously disturb the circulation of the blood through the organ. (*Bouillaud.*) This insufficiency, as a cause of dropsy, would appear to exist most commonly in the tricuspid valve. (*P. Blakiston.*)

When visceral disease exists to any great amount, the system of nutrition always becomes morbidly affected, a hydropic diathesis is induced, and transudation is readily accomplished through the walls of the particular vessels that are most engorged. We have an excellent example of this in the case of ascites induced by induration of the liver, to which allusion has been made under the proper head. In consequence of such induration the blood of the vena portæ cannot circulate freely through the liver; the branches of the vessel are engorged; and the nutrition of their parietes having become impaired by the general derangement of the whole system, they readily permit the transudation of the watery portions of the blood. In this case, dropsy of the lower belly is the consequence; but it can be easily understood, that similar diseases of other solid viscera, or impediments to the circulation, may lay the foundation for hydropic accumulations there or elsewhere. Chronic disease of the heart is a very common cause; and it need scarcely be said, that the dropsy, thus induced, does not readily admit of cure, inasmuch as the primary affection may be palliated, but cannot, in general, be removed radically.

Of partial dropsies, resulting from temporary obstructions of the circulation, we have a familiar example in intermittents, in almost all cases of which there is more or less enlargement of the spleen, and concomitant infiltration of the cellular membrane; but both affections pass away after the intermittent has been arrested.

Another cause of anasarca, and of dropsy of the cavities is the disease of the kidney, described, of late years, as the disease of Bright. In all the older and modern works on the practice of physic, suppression of urine, or a sudden diminution in the quantity of the secretion, has been esteemed a cause of anasarca, but the researches of modern observers have sufficiently shown, that a pathological condition of the kidney, in which the cortical portion

assumes a granular character, and secretes albumen from the blood, is by no means an uncommon cause. The characters of this renal affection are carefully described elsewhere.

A sudden suppression of the transpiration has been presumed to exert considerable agency in the production of anasarca, (*Andral, Osborne;*) but it is questionable, whether the exact relationship of cause and effect is here understood. The perspiration is certainly very generally diminished in hydropic affections; but this may be owing to the more copious exhalation of serous fluid into the cavities or cellular membrane, and the supposed effect may, consequently, be the cause. Under either view, the propriety of producing proper diaphoresis would be equally important. Certain it is, that obstruction of the perspiration is not alone sufficient to induce the disease, otherwise we should meet with it far more frequently; and even in those, who possess the hydropic diathesis, it may, we think, be questioned, whether it ought to be classed amongst the exciting causes.

Amongst those causes has been reckoned a modified condition of the blood; but the precise character of those modifications has not been defined. Plethora may, doubtless, have an influence. Amongst the physical causes of exhalation, adduced by a distinguished physiologist, (*Magendie,*) is the pressure experienced by the blood in the circulatory system, which is conceived by him to contribute powerfully to cause the more aqueous part to pass through the coats of the vessels. If water be forcibly injected, by means of a syringe, into an artery, all the surfaces, to which the vessel is distributed, as well as the larger branches and the trunk itself, exhibit the injected fluid oozing in greater abundance, according to the force exerted in the injection. He farther remarks, that if water be injected into the veins of an animal, in sufficient quantity to double or treble the natural amount of blood, a considerable distension of the circulatory organs is produced, and consequently, the pressure experienced by the circulating fluid is largely augmented. If any serous membrane be now examined,—as the peritoneum—a serous fluid is observed issuing rapidly from its surface, which accumulates in the cavity, and produces a true dropsy under the eyes of the experimenter. On the other hand, if a coloured solution be thrown into the cavity of the peritoneum in a living animal, and blood be then drawn,—as the blood flows from the vein, the coloured solution will be observed to pass from the peritoneum and mix with the fluid of the circulation. These are interesting physiological experiments, and especially so in relation to the pathology and therapeutics of dropsy.

On the other hand, an anæmic condition of the blood is, unquestionably, favourable to the generation of dropsical effusions; hence, we observe them, after repeated hemorrhages, which have drained the blood of its more solid portions, in long protracted abstinence, scorbutic and chlorotic cachexia, &c. When the blood is defibrinised from any cause—as under the experiments of the physiolo-

gists, or by certain morbid poisons received into it, foundation is likewise laid for infiltrations into the cellular membrane. (*Magen-die, Andral.*)

From all this it is obvious, that the condition of the blood must vary greatly in anasarca. When drawn from a vein, it usually happens, that the coagulum swims in the midst of an unusual quantity of serum. It is not often covered by an inflammatory crust, unless occasionally in the dropsy which is associated with granular disease of the kidney.

Pathological characters.—On the examination of the subcutaneous cellular tissue of one who has died of an anasarca, it is found distended by a limpid serous fluid, usually of a bright orange yellow hue. At times, however, when the infiltration has been accompanied by inflammatory action, the cellular membrane has been found red, injected, and presenting, here and there, points of induration. In the most common cases of asthenic anasarca, the fluid is found bathing the cellular tissue and the subjacent muscles, which are rendered unusually pale and flaccid, and tear with the greatest ease; and the vessels that traverse the cellular membrane are less filled than is usual. Sometimes, the infiltration is restricted to the subcutaneous cellular tissue; but, at others, it extends to that which envelopes the fasciculi and the fibres of muscles, the tendons, vessels and nerves, and occasionally that which enters into the constitution of the viscera participates. Wherever the infiltration exists, the cellular tissue appears to be much softened; and, at times, assumes a subgelatinous appearance, (*Nonat,*) except in a form of œdema elsewhere described—the œdema of the new born—in which it appears to acquire a greater density.

Chemical analysis has shown that the ordinary fluid of anasarca is composed chiefly of water, albumen, muco-extractive matter, chloride of sodium, chloride of potassium, sulphate of soda, phosphate of soda, iron and magnesia. Occasionally, in the dropsy that is dependent upon granular disease of the kidney, it exhibits traces of urea.

Treatment.—The consideration of the causes of anasarca sufficiently indicates, that great diversity must exist in its treatment under different circumstances. These causes must be clearly appreciated: the main indication, in all cases, will be to obviate them; and the next to remove the fluid already collected in the cellular membrane.

It too often, unfortunately, happens, that the pathological causes of anasarca,—in other words, the primary disease on which it may be dependent,—are beyond the power of medicine. The affections of the heart; the indurated liver, the granular kidney, and the generally broken down constitution of hydropics are conditions, which, of themselves are of fatal character, and the anasarca is but a symptom. It need scarcely be said, that the

efforts of the practitioner must be directed to the removal of these primary diseases, unsuccessful as those efforts will too often prove.

Not unfrequently, the precise pathological condition that gives occasion to the infiltration is inappreciable. In such case, the practitioner is compelled to be guided by the general symptoms that have been pointed out, and to endeavour to discover, whether the disease be accompanied by symptoms of vascular activity, or the contrary. Should the former be the case, a treatment, adapted for sthenic diseases, may be necessary, and blood-letting may have to be practised, and even repeated more than once. Bleeding not only reduces the over excitement, but, as already remarked, is one of the most powerful promoters of absorption we possess. Accordingly, the dropsy has occasionally yielded, as if by enchantment, to blood-letting.

On the other hand, if the infiltration occurs in a person whose circulation is feebly carried on, blood-letting may be decidedly improper, and can, indeed, have no other effect than that of augmenting the evil. If the blood possesses the morbid tenuity, which it does in the various forms of anæmia and cachexia, described above, a system of management, recommended under those heads, becomes indispensable. Unless the spissitude of the blood be augmented, and the nutrition of the parietes of the vessels improved, the fluid will continue to transude.

When a proper attention to the condition of the different organs of the economy, and to the circulating fluid fails to remove the symptomatic infiltration, the next indication arises, which is to promote the absorption of the fluid, and its discharge, by the different emunctories.

Of blood-letting, mention has already been made. As a powerful sorbefacient, it is adapted to particular cases of anasarca, but not to all; and it must always be employed with a wise caution.

Emetics were, at one time, highly recommended, and the concentration of vital action, which they induce in the stomach, has occasionally had a good effect, (*Sydenham*;) but they are rarely employed at the present day, in consequence of their having no properties, not equally possessed by cathartics, and still more by diuretics.

The cathartics, usually prescribed where there is no serious visceral disease, are those termed "hydragogue," or which excite copious watery evacuations;—thus, not only producing a revellent action upon the bowels, but diminishing the amount of the fluid of the circulation.

The cathartics, that are most frequently employed with this view, are jalap and the bitartrate of potassa, alone, or in combination, as in the form of the pulvis jalapæ compositus, (gr. xxx—ʒij.) gamboge,¹ scammony and elaterium, alone, or associated together, or with other articles.

¹ R.—Potass. bitart. ʒij.

Pulv. jalap. ʒj.

Pulv. gambog. gr. vj.—M. et divide in part. vj.

One of these to be given three or four times a day, until they act strongly on the bowels.

Some practitioners, in these and similar cases, are in favour of combining several analogous remedies in small quantities, rather than of giving a single one in a large dose. (*Paris, Graves.*) The author has not been able to discover the advantage of this course, although he has instituted several comparative trials with the view of testing it. It is upon this principle, however, that a recent distinguished practitioner has advised the following combination of cathartics. (*Graves.*)

R.—Pulv. jalap.

— Rhei.

Scammon. āā gr. v.

Elaterii, gr. ss.

Potass. bitartrat.

Potass. sulphat. āā ʒss.

Syrupi zingiber, q. s. ut fiat bolus.

The elaterium acts very energetically on the intestines, and gives occasion to a copious discharge of watery secretion from the lining membrane; but it is harsh, and hazardous in its operation; and neither it nor any of the drastics is proper where an inflammatory condition of the mucous membrane of the stomach or intestines is coexistent.

The revellents, most frequently employed in dropsy, are such as act on the kidney, and increase the urinary secretion; combined, or not, with the cathartics, as already recommended. Yet diuretics, of the stimulating kind especially, are not adapted for all cases, and especially for such as are dependent upon granular disease of the kidney. In ordinary cases, where no visceral disease contra-indicates its use, we have recourse to the infusion of juniper berries, alone, or associated with the bitartrate of potassa.

R.—Baccar. junip. ʒj.

Aquæ fervent. Oij.

Potassæ bitartrat. ʒij.

To be used for common drink, whenever the patient is thirsty.

A solution of the bitartrate of potassa, made into a kind of lemonade, is also given for common drink.

R.—Potass. bitartrat. ʒij.

Cort. limon. recent. ʒj.

Sacchar. ʒj.

Aquæ bullient. ℥j.

The squill is likewise given, either alone,¹ or united with digitalis² or with calomel.³

¹ R.—Pulv. scillæ, gr. j.

— glycyrrhiz. gr. ij.—M. et

fiat pil. ter die sumenda.

² R.—Pulv. scillæ.

— digital. āā, gr. j. fiat pil.

ter die sumenda.

³ R.—Pulv. scillæ, gr. j.

Hydrargyr. chlorid. mit. gr. ss.

Pulv. glycyrrhiz. gr. ii.—M. fiat pilula.

The last combination may be continued until it affects the mouth slightly, or, in other words, exerts its revellent action on the system, which is often most salutary. The joint revellent action of the squill on the kidney, and of the mercury on the secernent system in general, gives occasion to the absorption of the effused fluid, whilst the augmented renal secretion, induced by the former, evacuates the absorbed fluid, and likewise stimulates the whole of the absorbent system to greater activity. Not unfrequently, digitalis is given in the form of infusion or tincture, or both.

R.—Infus. digital. ℥iv.

Tinct. digital. ℥j.—M.

Dose, a tablespoonful, three or four times a day.

Care must be taken, however, in all cases, not to push it too far, but to arrest its employment when it begins to affect the circulation or the stomach. It has been properly remarked, (*Geo. Gregory*), that there is probably no plan of treatment adapted to such a variety of cases, as the union of digitalis or squills with mercury, and such has been the result of the observation of the author.

The colchicum was highly recommended as a diuretic, (*Störck*), and it has been given in still more recent times. In such cases, it may be well to push the remedy until it affects the stomach or bowels.

R.—Vin. colchic. ℥j.

Sp. æth. nitric. ℥iij.

Mucilag.

Syrup. āā, ℥ij.

Aquæ, ℥iijss.—M.

Dose, one-third part, three times a day.

Many other diuretics—as the acetate and the nitrate of potassa—have also been administered, but they are generally inferior to those already mentioned. The more stimulating—as the oleum terebinthinæ, the copaiba, and cantharides, can rarely be needed, and are always to be administered with great caution.

They, who have considered that general dropsy is induced by obstructed perspiration, have endeavoured to restore it by various diaphoretics—as the pulvis ipecacuanhæ compositus—but they are rarely of much advantage. It has been already remarked, that obstruction of the perspiration is seldom or never the cause of dropsy, and, therefore, remedies that are blindly addressed to its restoration, cannot be expected to prove of much benefit. Dover's powder may afford relief, however, by its hypnotic properties.

Much difference of sentiment has existed in regard to the quantity of drink that should be permitted to hydropic patients. Whilst some restrict them altogether, others allow as much as they are capable of taking. Perhaps the best rule is the desire of the patient, indulged in moderation. (*Mackintosh*.) In the generality of cases of anasarca, the disease consists less in too great a quantity of aqueous fluid in the vessels, than in loss of balance between the exhalents and absorbents; yet still, as already remarked, repletion

of the vessels is unfavourable to ready absorption; and, therefore, drink should only be allowed with the view of alleviating thirst.

Owing to its powerful agency in modifying nutrition, iodine has been prescribed by many practitioners. Several cases, it is affirmed, have been removed by a mixture of the ioduretted iodide of potassium,¹ aided by an ointment of iodine,² placed inside the thighs, the cuticle having been removed by a blister.

¹ R.—Iodin. gr. iij.
Potass. iodid. gr. vj.
Aquaë, ℥j.—M.

² R.—Iodin. gr. xv.
Potass. iodid. ʒss.
Adipis, ʒj.—M.

Dose, six to fifteen drops, three times a day.

The arm-pits and soles have, also, been rubbed with the ointment. (*Coster, Osborne.*)

In regard to the local means to be employed in anasarca, with the view of promoting the absorption of the infiltrated fluid, much need not be said. But few, indeed, are of any efficacy. Methodical compression, by means of a bandage or laced stocking, has appeared, at times, to be of service; but, usually, it is merely necessary as a support, when the integuments are largely distended by the fluid. In the generality of cases, the benefits from the bandage are more apparent than real,—the water being simply forced from the cellular membrane pressed upon, into other portions, and returning to its former situation when the pressure is removed. Frequently, in these cases of large distension, the integument becomes inflamed, and is apt to slough. Washes of the subacetate of lead, diluted, or of weak creasote water, or the application, by means of a camel's hair pencil, of the tincture of iodine, are often prescribed, along with the gentle support of the bandage; but warm applications—as a poultice—have proved more serviceable in the author's experience. The vitality of the integument is interfered with by the fluid effused beneath it, and gentle warmth tends to enable it to free itself from the asthenic hyperæmia. The spontaneous giving way of the integument must always be prevented, if practicable, as it is almost invariably followed by sloughing.

When the infiltration is considerable, and there is apprehension that spontaneous rupture of the integument may occur, it may become advisable to evacuate it. For this purpose, various plans have been recommended. Punctures—made with the point, or scarifications with the shoulder of a lancet—have been used, and, at times, with advantage. They are occasionally, however, followed by gangrenous inflammation of the skin and subjacent parts; and the same remark applies to the employment of blisters and issues. At an advanced period of the disease, when the vitality of the parts has been reduced by the protracted pressure of the fluid, they should be employed with great caution; and in almost all cases, it will be advisable that the punctures should not be too numerous or too close together. As the fluid is discharged, a gentle pressure should be made upon the distended integument. The

operation of acupuncture has been used advantageously to drain off the fluid. In such case, larger needles than those in common use are needed. Some prefer them of the size of an ordinary glover's needle, and of a triangular shape—a puncture of this kind being less likely to close. (*Graves, King.*)

It is obvious, from all that has been said, that the treatment of anasarca, as well as of dropsy in general, must repose essentially upon an attention to the causes that have given rise to it; and unless these are obviated, it matters not that we remove the fluid already secreted; it will be constantly reproduced. No fixed plan of treatment can be laid down. The functional phenomena, as well as the organic mischief, where it exists, must be accurately appreciated, and treated accordingly. The mode of management—as already seen—which is applicable to sthenic dropsy, cannot be advisable in the asthenic, and the particular visceral disease must demand a medication adapted to it. In like manner, the dropsical effusions, which supervene on particular diseases, present characters that are not readily mistaken. Those that follow intermittent fever, require a continuance of the same plan as is indicated in the intermittent itself; and such as succeed to exanthematous affections need more activity, as all the phenomena exhibit that they belong to the sthenic form of dropsy. (*See Scarlet Fever.*)

The diet, throughout the affection, must be regulated—according as the dropsy is sthenic or asthenic—on principles that have been so often pointed out as to render repetition unnecessary. It may be proper, however, to remark, that the advantages of a milk diet have been strongly insisted on of late. (*Vailhé.*)

VI. CANCEROUS CACHEXIA.

SYNON. Cachexia cancerosa, Cancer, Carcinoma; *Fr.* Cachexie cancéreuse; *Ger.* Krebs.

Although it has been maintained by some, that cancer, in its various forms, may be a mere local degeneration, it can scarcely be doubted, at the present day, that such degeneration is allied to a special condition of the system or cachexia. Accordingly, this has been made to enter as a part of the definition of the disease by pathologists. One of the most recent and able of these properly defines cancer to be “a disease anatomically characterized by the presence of scirrhus, encephaloid or colloid, originating in a general vitiation of the economy, and possessing the properties of assimilation, of reproduction, and of destroying life by a peculiar cachexia.” (*W. H. Walshe.*)

The subject of cancer falls so generally under the consideration of the surgeon, that it will not be necessary to dwell upon it here. Inasmuch, however, as the cancerous affections of internal organs fall in the domain of internal pathology, and are, accordingly, considered in various parts of this work, a few general observations on the cachexia may be necessary.

A writer of distinction, both on physiology and pathology, (*J.*

Müller,) from his anatomical researches is disposed to consider, that no division of pathological structures into homologous and heterologous can be established; and he maintains, that the elementary structures of all morbid growths, hitherto examined, resemble, in every respect, the structures presented in the several stages of development of the elements of the healthy tissues of the body; and as the element in the healthy tissues is a nucleated cell, (*Schwann* and *Schleiden*,) so also cells growing upon nuclei, and developing new cells within themselves, or elongated into caudate or spindle-shaped bodies, or in a still higher stage of development forming fibres, are conceived to form the main structure of all morbid growths. Blood-vessels are later formations, as they are known to be in the materials that constitute the embryo. (*J. Müller*.)

It appears clear, however, that even if we admit the cytoblast or germinal cell to be the same in the healthy and in the heterologous tissue, there must be an impulse seated in the one, which is not present in the other, and which leads to a different development; and, consequently, it is proper for us to regard cancer as a heteroclite or heterologous formation, and it is so considered by the writer above cited, (*Walshe*,) whose classification of the genus cancer or carcinoma, and description of the characters of its species are adopted here, as according, in all respects, with the views of the author.

Genus Cancer or Carcinoma.

<i>Species.</i>	<i>Varieties.</i>	<i>Synonyms of the Species.</i>
Encephaloid.	Common vascular sarcoma. } ABERNETHY.	Spongy or ossivorous tumour. RUYSCH, PALLETTA.
	Mamm. sarcoma? } ABERNETHY.	Struma fungosa (testis). CALLISEN.
	Solanoid. RECAMIER. ZANG.	Spongoid inflammation. BURNS.
	Nephroid. <i>Idem</i> .	Milt-like tumour. MUNRO.
	Napiform. <i>Idem</i> .	Medullary sarcoma. ABERNETHY.
	Carcinoma fasciculatum vel hyalinum. MUELLER.	Cerebriform disease or cancer. LAENNEC.
	Fungus hæmatodes. HEY.	Pulpy testicle. BAILLIE.
	Hématode cancer. AUCT. GALL.	Carcinus spongiosus. GOOD.
		Carcinoma spongiosum. YOUNG.
		Fungoid disease. A. COOPER. HODGKIN.
Scirrhus . .	Pancreatic sarcoma? ABERNETHY.	Medullary fungus. MAUNOIR. CHELIUS.
	Napiform. } RECAMIER.	Acute fungous tumour. C. BELL.
	Chondroid. } RECAMIER.	Medullary cancer. TRAVERS.
	Lardaceous tissue. AUCT. GALL.	Cephaloma. HOOPER. CARSWELL.
	Carcinoma reticulare. MUELLER.	Carcinoma medullare. MUELLER.
Colloid . .		Soft cancer. AUCT. VAR.
		Carcinomatous sarcoma. ABERNETHY.
		Carcinoma scirrhosum. YOUNG.
		Scirrhus, cancer. TRAVERS.
		Scirrhus, cancer. CARSWELL.
		Carcinoma simplex vel fibrosum. MUELLER.
		Stone cancer. AUCT. VAR.
		Areolar gelatiniform cancer. CRUVEILHIER.
		Carcinoma alveolare. MUELLER.
		Gum cancer. HODGKIN.

These three species of carcinoma are thus described in a tabular manner by Dr. Walshe:—

<i>Encephaloid.</i>	<i>Scirrhus.</i>	<i>Colloid.</i>
Resembles lobulated cerebral matter.	Resembles rind of bacon traversed by cellulo-fibrous septa.	Has the appearance of particles of jelly inlaid in a regular alveolar bed.
Is commonly opaque from its earliest formation.	Has a semitransparent glossiness.	The contained matter is strikingly transparent.
Is of dead white colour.	Has a clear whitish or bluish yellow tint.	Greenish yellow is its predominant hue.
Contains a multitude of minute vessels	Is comparatively ill supplied with vessels	(Its vessels have not been sufficiently examined as yet.)
Is less hard and dense than scirrhus.	Is exceedingly firm and dense.	The jelly-like matter is exceedingly soft; a colloid mass is, however, firm and resisting.
Is frequently found in the veins issuing from the diseased mass.	Has not been distinctly detected in this situation.	The pulaceous variety has been detected in the veins.
The predominant microscopical elements are globular, not always distinctly cellular, and caudate corpuscula.	The main microscopical constituents are juxtaposed nuclear cells; caudate corpuscula do not exist in it.	Is composed of cells in a state of <i>emboitement</i> .
Occasionally attains an enormous bulk.	Rarely acquires larger dimensions than an orange.	Observes a mean in this respect.
Has been observed in almost every tissue of the body.	Its seat, as ascertained by observation, is somewhat more limited.	Has so far been seen in a limited number of parts only.
Very commonly coexists in several parts or organs of the same subject.	Is not unusually solitary.	Has rarely been met with in more than one organ.
Is remarkable for its occasional vast rapidity of growth.	Ordinarily grows slowly.	Grows with a medium degree of rapidity.
Is frequently the seat of interstitial hemorrhage and deposition of black or bistre-coloured matter.	Is comparatively rarely the seat of these changes.	
When softened into a pulp, appears as a dead white or pink opaque matter of creamy consistence.	Resembles, when softened, a yellowish brown semitransparent gelatinous matter.	Undergoes no visible change of the kind.
Subcutaneous tumours are slow to contract adhesion with the skin.	Scirrhus thus situate usually becomes adherent.	
Ulcerated encephaloid is frequently the seat of hemorrhage, followed by rapid fungous development.	Scirrhus ulcers much less frequently give rise to hemorrhage, and fungous growths (provided they retain the scirrhus character) are now more slowly and less abundantly developed.	
The progress of the disease after ulceration is commonly very rapid.	There is not such a remarkable change in the rate of progress of the disease after ulceration has set in.	
Is the most common form under which secondary cancer exhibits itself.		
Is the species of cancer most frequently observed in young subjects.	Is much less common before puberty.	Has so far been observed in adults only.

Of the organic and functional phenomena presented by cancer, when it affects the internal organs, a full description has been given under the appropriate heads. This renders it unnecessary to dwell upon them in this place. The appropriate remedies to be adopted have, likewise, been enumerated. Unfortunately, it is too probable, that when carcinoma has invaded an internal organ, it is never cured. It is affirmed, indeed, that it has never been removed by medicinal agents alone. The only class of remedies, that can be expected to afford any essential benefit, are those that are capable of inducing a new condition in the system, by modifying the function of nutrition,—such as the various preparations of iodine, combined with a thorough change of everything surrounding the indi-

vidual. The cachexia is the real morbid condition, and the cancerous affections in particular organs but so many evidences of it, as tubercles in the lungs are mere expressions or indications of another form of cachexia, equally possessing the whole system. Hence it is, that cancerous tumours on the external parts of the body are so apt to recur after they have been removed by the surgeon. Still, it must be admitted, that in cases of scirrhus tumours, when they have been removed early, there has very frequently been no return of the disease. The particular species of cancer influences, however, the probability of recovery. It would seem, that there are few examples of permanent recovery after the removal of encephaloid tumours. (*Walshe*.) Of course, the earlier the mass is removed, the greater are the chances of entire recovery, for the continuance of the local lesion cannot fail to react on the general system, and to further the greater development of the cachexy.

VII. SYPHILITIC CACHEXIA.

SYNON. Cachexia venerea, Syphilis, S. maligna, Lues venerea, L. Syphilis, Morbus Gallicus, M. Italicus, M. Neapolitanus, M. Hispanicus, M. aphrodisius, Syphilismus, Cacochymia venerea, Venereal disease, Pox, French pox; *Fr.* Vérole, Maladie vénérienne, Mal de Naples, Mal Français, Maladie de Vénus; *Ger.* Venerische Krankheit, Lustseuche, Franzosensucht.

The subject of syphilis has engaged the attention of pathologists at different periods more perhaps than any other; and although treatise upon treatise has issued from the press of almost every age and country, there is, at the present time, no single disease which is giving rise to more close investigation. The misfortune has been in this, as in too many cases, that exclusive views have generally been embraced: whilst one set of theorists has considered the disease to be specific; others have believed it to be common; and whilst, again, some have regarded it as capable of being removed without the agency of mercury; others—and some even of the present day—esteem mercury as its “antidote,” and believe, that the system cannot be dispossessed of the *vice* without its agency. The truth would seem to be, that although the disease, when it has become constitutional, is a true cachexia, its primary forms may be removed by a simple treatment,—that some even of the constitutional forms may be cured in this manner; but that, in other cases, a revellent action becomes necessary; and remedies are demanded, which are capable of breaking in upon the morbid condition of the system of nutrition.

From the statistical inquiries of various excellent observers, (*Fricke, Devergie, Ruz, Rapatel, L. Desruelles, Judd*, and others,) it would appear that of about 80,000 cases of syphilis, subjected to experiment, the proportion of relapses or of secondary affections—where the primary symptoms in the sexual organs had been treated without mercury—was, at its lowest estimate, reduced to *ten*, at its highest to *twenty* in the hundred; and results, obtained in this country, have been at least as favourable. “We are

perfectly willing"—says a recent writer—"to admit, that the great irregularities, which characterize syphilis, and the very different conditions under which it appears, give less force to statistical evidence applied to its elucidation than to that of many other diseases; yet making every due allowance for data thus collected, and taking into consideration the incompetency of many of the individuals to observe accurately, and the party feeling of others, together with the perplexities arising from the maladministration of mercury, &c. it cannot be denied, that a sufficient mass of observations remains to establish the fact, that a large majority of primary syphilitic affections get well, like ordinary ulcers, under simple treatment, or even by the unaided powers of the constitution; and that of those cases of secondary disease which do occur, although, perhaps, subject to more frequent relapses, the greater number will ultimately wear out, or be overcome by the mere action of the secretory and excretory functions; thus leaving but a small remainder of inveterate instances to be combated by other means." (*British and Foreign Medical Review*, Vol. V. p. 7.)

In another place, the author has treated of Urethritis, and of that which constitutes gonorrhœa virulenta. This has been supposed to be produced by the same virus as that which occasions syphilis, but the results of inoculation, and, indeed, of general observation, sufficiently show, that gonorrhœa and syphilis are by no means convertible diseases, and that if a primary syphilitic sore sometimes results from the application of gonorrhœal matter, it may be owing to the person from whom it was taken being affected simultaneously with both diseases. (*H. Mayo*.)

The intimate investigation of syphilis is considered, by common consent, to belong to the domain of Surgery, and, accordingly, it is treated of in detail in works on that department, and still more in the valuable monographs, that have been published recently by many excellent observers. (*Desruelles, Colles, Baron Boyer, W. H. Judd, Ricord, Championnière, Wallace, H. Mayo, Acton, L. Parker, &c.*) It may not be amiss, however, to make a few general remarks upon the

Treatment.—This is of two kinds, the *simple*, and the *revelent*.

In the simple, the management is partly hygienical, partly therapeutical. The diet must be light, and not sufficient to entirely allay the appetite; and as the patient recovers, the quantity may be greater: diluent drinks are allowed freely, such as barley water, and decoctions of liquorice, flaxseed, alone or mixed with milk,—several pints being taken in the day. Perfect mental and corporeal quietude must be enjoyed, with which view the patient should remain in bed: the bowels must be kept open by gentle laxatives, or emollient enemata; the temperature of the room being uniform, and the air pure. In the convalescent stage, exercise or change of air may be recommended.

As regards the topical management, strict attention is paid to cleanliness and to proper position of the affected parts. The simplest dressings are made to the sores; the frequent employment of leeches to the part, even when the surface is ulcerated, is recommended. When the ulcer becomes cleansed, stimulating lotions favour the cicatrization. (*Desruelles.*)

This plan, variously modified, comprises the simple treatment; but should it fail, or consecutive symptoms arise, it may be then advisable to have recourse to the revellent.

It is on this that the practitioner generally places his full reliance in syphilitic cachexia. Formerly, there was but one agent—mercury—which was relied on with this object; and, on the whole, in confirmed constitutional syphilis, mercury, perhaps, deserves the preference, provided there are no contra-indications to its use. (*Ricord, Humbert, H. Mayo.*) At the present day, the forms of preparation most commonly, perhaps, prescribed, are—the protiodide, (*Ricord*; but others prefer the corrosive chloride, (*Cullerier, Dupuytren*;) and others, again, adhere to the blue pill, or to the mild chloride, or to friction with the mercurial ointment. By modern writers, on syphilis especially, a combination of opium with the mercurial is strongly recommended. (*Bielt, Ricord, Cullerier.*)

Of late, the iodide of potassium—simple, and ioduretted—has been brought forward with high encomiums in the various forms of constitutional syphilis, (*Ricord, Cullerier*;) and the author has seen marked benefit from it in several cases. It has been found most efficacious in the tertiary forms of the disease, in which M. Ricord thinks mercury is generally inefficacious.

The revellent treatment, it will be seen, reposes upon the modified effect induced on the tissues by certain articles, which probably alter the condition of the fluid of the circulation, and, through it, that of the system of nutrition in every part of the œconomy: it has, however, to be persevered in for some time, and, of course, to be varied according to the different forms which the disease may assume, but its general application is now admitted by all, in cases which do not yield to the simple treatment.

For the special modifications that may be demanded, the reader must consult the various modern works on external pathology; and especially the excellent monographs on syphilis already cited.

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